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ABSTRACT

The National Center for Education Statistics commissioned the papers in this publication to address education-finance issues of interest to the education-finance community. Although teacher salaries rose between 1980 and 1997 by 120 percent, that is only equal to a 19 percent increase after removing inflation, or a little over 1 percent per year. Moreover, starting salaries have changed little in comparison to average salaries. Another paper discusses school financial statements, which are only one source of information that is relevant to assessing a school district's finances. School-district employee pensions, often the largest long-term obligations, may not appear in these reports. A third paper discusses two approaches to reporting school-level finance information, and how to make inflation and geographic cost adjustments in education. Adjustments for inflation and geographic differences are not easily implemented in education, because most of the costs in education are in personnel, rather than in things, which are easier to measure in terms of quality and quantity. Measuring cost differences in education is even more difficult that measuring changes in automobiles, for example. The final paper deals with the consideration of who will be the primary users of school-level data, what new data they need, and for what purposes. The authors suggest that principal stakeholders should be schools and school districts, state and national policymakers, researchers and policy analysts, and the public, represented by parents and taxpayers, special interest groups in education, and the financial community. (Each paper contains references.) (DFR)



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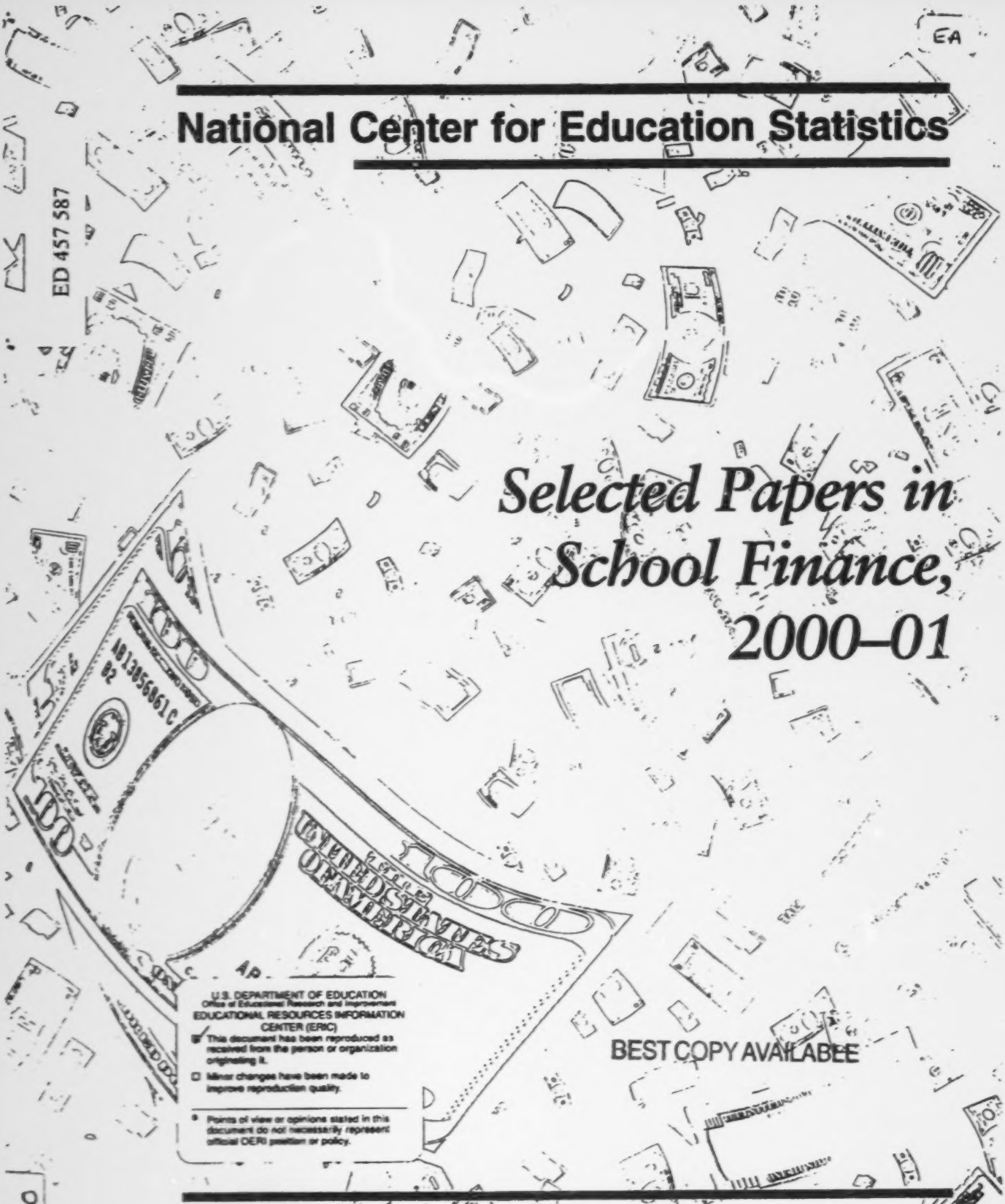

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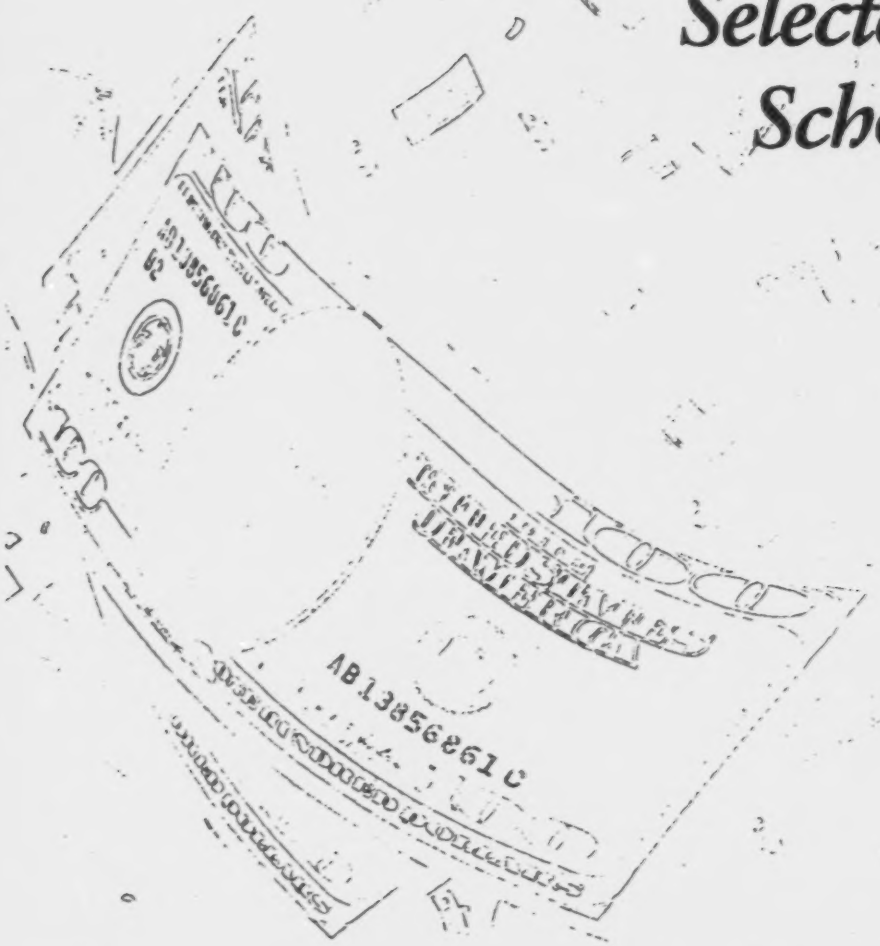

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# Dedication

## *In memory of William S. Myers, 1925–2000*

This year's Selected Papers in School Finance is dedicated to William S. Myers. He spent his life as an economist, analyst, and finance specialist for many state and federal agencies. He firmly believed that a well-funded public education system is the cornerstone of the country's social, economic, and political structure. He received his Bachelor's degree from the College of Wooster and earned his Master's degree from the University of Kentucky.

In his final position, Will worked for the National Education Association in the research division as the manager of the school finance section. Much of his work promoted stable, adequate sources of revenue for public schools. In honor of his participation, work and accomplishments, the American Education Finance Association (AEFA) established the Will Myers Memorial Scholarship Award. The scholarship awards $250 to two annual conference presenters who have been or currently are teachers.

# Foreword

*Jeffrey A. Owings, Associate Commissioner*
*Elementary/Secondary and Libraries Studies Division*

The National Center for Education Statistics (NCES) commissioned the papers in this publication to address education finance issues of interest to the education finance community. These papers address how teacher compensation has changed over time; how to assess the financial condition of public school districts; two approaches to reporting school-level finance information; and how to make inflation and geographic cost adjustments in education. All four papers continue the NCES tradition of commissioning papers that address measurement issues of the education finance research community.

This compilation of papers is intended to promote the exchange of ideas among researchers and policymakers. Because the views are those of the authors, the papers may provoke discussion, replications, replies and refutations. If so, the publication will have accomplished its task, to raise the awareness of the finance community to new techniques for working with school finance data.

# Acknowledgments

The editor wishes to gratefully acknowledge the comments and suggestions of the reviewers: Marilyn M. McMillen and Karen O'Conor of the National Center for Education Statistics (NCES). I also wish to acknowledge the contributions of Susan Baldridge and Carol Rohr of Pinkerton Computer Consultants, Inc. who edited the manuscript, incorporated the text, tables, and graphics into a published document, and designed the cover.

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# Introduction and Overview

William J. Fowler, Jr.
National Center for Education Statistics

## About the Editor

William J. Fowler, Jr. is the program officer of the Education Finance Program in the Elementary and Secondary Education and Library Studies Division at the National Center for Education Statistics (NCES), U.S. Department of Education. He specializes in elementary and secondary education finance and education productivity research. He is currently involved with devising a fast-response survey for school business officials to obtain an understanding of how energy costs are affecting school district fiscal health, and reporting the results in user-friendly language. He is also engaged in research regarding the equity and adequacy of resources for Kindergartners. His great passion is designing Internet tools for the NCES education finance web site at http://nces.ed.gov/edfin, as well as the graphic display of quantitative data.

Dr. Fowler has worked for NCES since 1987, before which he served as a supervisor of school finance research for the New Jersey Department of Education. He has taught school finance at Bucknell University and the University of Illinois, and served as a senior research associate for the Central Education Midwestern Regional Educational Laboratory (CEMREL) in Chicago and for the New York Department of Education. He received his doctorate in education from Columbia University in 1977.

Dr. Fowler received the Outstanding Service Award of the American Education Finance Association (AEFA) in 1997, having served on its Board of Directors during the 1992–95 term, and has been re-elected for the 2001–04 term. He serves on the editorial board of the *Journal of Education Finance* and the *Educational Evaluation and Policy Analysis Journal* of the American Education Research Association. He formerly served on the Board of Leaders of the Council for Excellence in Government, and was a 1997–98 Senior Fellow. He was a member of the Governmental Accounting Standards Board (GASB) Advisory Committee charged with developing a *User Guide for Public School District Financial Statements*.

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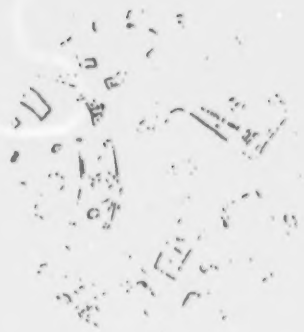

# *Introduction and Overview*

# Introduction and Overview

William J. Fowler, Jr.
National Center for Education Statistics

The education finance community faces a wide variety of measurement issues. The first such measurement issue arises in trying to understand how teacher compensation has changed over time. Not only is there interest in comparing the change in teacher salaries to the change in benefits over time, but also how these changes in teacher compensation compare to changes for other comparable workers. Central to the measurement of how compensation changes over time is how to remove inflation from these changes. A second paper examines the conceptual and methodological approaches for making inflation and geographic cost adjustments in education. Inflation and geographic adjustments in education are a measurement issue in which the uniform acceptance of a particular approach remains elusive. A third paper discusses some tools of the trade for assessing the financial condition of public school districts. The final paper presents an attempt to devise a synthesis of two divergent approaches to school-level financial reporting, an admittedly difficult task. In the accounting approach, school-level reporting is simply a downward extension of reporting at the school district-level. The resource cost model, however, attempts to reflect actual differences in staff deployment, and the costs associated with that choice of staff allocation.

Daniel D. Goldhaber, of the Urban Institute, asks the reasonable question for the period from about 1980 to the present, *"How Has Teacher Compensation Changed?"* As Goldhaber acknowledges, the answer to this simple "...question is more complicated than one might initially imagine." Although teacher salaries rose between 1980 and 1997 by 120 percent, that is only equal to a 19 percent increase once one removes inflation, or a little over a percent per year. This makes one wonder whether teaching, given changes in compensation, has become a less attractive occupation compared to comparable employment. To answer this question, Goldhaber uses data from the Bureau of Labor Statistics' employment cost index (ECI) to make comparisons over time. His paper first provides an overview of the empirical literature—linking teacher quality and teacher compensation. Evidence abounds that teacher quality is the single most important school factor affecting student achievement. Most school districts have a salary schedule that is based on teacher experience and degree status, and teachers are placed on the salary guide in accordance with these two characteristics, although there is scant evidence they are correlated with student outcomes. Nevertheless, this appears to be a practice that is similar to other state and local government employ-

ees. Although some school districts pay signing or retention bonuses for teachers in specialty fields where recruitment is difficult, pay for performance efforts have been short-lived. Private education, in contrast, however, does seem to compensate teachers for performance, field of specialization, quality of college, and academic attainment, which may be related to student outcomes.

Goldhaber argues that it is difficult to assess changes in teacher salaries unless one also understands the effects of inflation and salaries in other occupations to which teachers may flee. Very little information is available to appraise teacher benefits over time. Only aggregate information is available. Also, most public school districts offer teachers retirement packages and medical insurance. Large majorities offer dental insurance and life insurance, although such in-kind benefits as meals, transportation, and tuition reimbursement are less common. Teachers roughly receive comparable employee benefits as those available to state and local government workers, which are far superior to the private sector.

Using a variety of inflation adjustments, Goldhaber examines the average salaries of teachers from 1987–88 to 1993–94, as well as using data collected by the Bureau of Labor Statistics (BLS). He uses these BLS data to show how average teachers' salaries have changed relative to salaries for all civilian workers, those in private industry, and those in state and local government, as noted:

> Throughout most of the 1980s and 1990s the rate of increase of teachers' salaries exceeded that of other occupations...until very recently (1996–98) teaching increasingly became a (financially) more attractive field to be in throughout much of the last two decades.

However, Goldhaber finds that starting salaries in teaching have changed little in comparison to average salaries. In addition, starting salaries in teaching have typically been far behind salaries in other comparable occupations. Since few school systems provide the flexibility to pay teachers for teacher attributes that matter, teachers who have the opportunity to flee for other advancement may do so. This situation, Goldhaber concludes, is unlikely to improve unless there is an increase in teachers' compensation.

While Goldhaber deals peripherally with inflation adjustments, **William J. Fowler, Jr.**, of the National Center for Education Statistics, and **David H. Monk**, Dean of the College of Education at Pennsylvania State University directly address two types of cost adjustment in education, inflation adjustments and geographic adjustments. Drawn from a larger work, this article attempts to summarize their book *A Primer for Making Cost Adjustments in Education*. Most people intuitively recognize geographic differences in costs and in measuring inflation. Everyone understands that a house in suburban Westchester, outside New York City, may cost more than the same house located in upstate New York. In addition, as a result of the work of the U.S. Department of Commerce, Bureau of Labor Statistics, development of the Consumer Price Index (CPI), most of the public understand that the present price of an automobile (now in the $25,000+ range) has increased over time, so that the prices paid by our parents' (in the $5,000+ range) seem incredibly reasonable. This does not mean that all the issues present with inflation, outside of education cost adjustments, have been resolved. Take, for example, the change in the price of the automobile over time. Quality changes may make comparability difficult. A 1984 automobile and a 2000 automobile have substantially different features, even for the same base price. Imagine the OnStar® system (a system of pushing a button and being connected via satellite to an assistance service), air bags or anti-lock brake systems, or an electronic stability program (ESP), which prevents skids. All of these automobile features were unavailable at any price in 1984.

One would think, based on these examples, that adjustments for inflation and geographic differences might be easily implemented in education. Alas, Fowler and Monk assert, the reverse is true. Since most of the costs in education are in personnel, rather than in things, which are easier to measure in terms of quality and quantity, measuring cost differences in education is even more difficult than measuring changes in, say, automobiles. Complicating the cost of education is that it can be defined as follows:

> The minimum of what must be given up to accomplish some result. 'Expenditure' is different from 'cost' in that expenditures are not tied to results or outcomes and can exceed the minimum of what must be given up.

Fowler and Monk believe that cost adjustments, which are not now commonly employed in reporting expenditures either in different geographic regions, or over time, should become standard practice. Certainly a beginning teacher salary of $35,000 means very different things in New Jersey in comparison to South Dakota. In addition, 10 years ago, a beginning teacher salary of $35,000 would have been quite an incentive, while 10 years from now, it may be perceived as quite inadequate.

In a review of the attempts of several scholars to devise a geographic cost adjustment, Fowler and Monk explain that determining the relative cost of hiring and retaining comparable teachers requires not only adjusting for geographic cost differences that are outside of the control of a school district, but also holding constant those cost differences controlled by the school district. For example, crime, climate, and residential desirability are clearly not something the school district has control over. An example would be San Francisco, California and Anchorage, Alaska. Class size, the number of male hires versus female hires, and the credentials of a teacher are cost features a school district can influence. Chambers has raised the notion of "hedonic" or amenities that should be taken into account. To understand amenities, one need only compare the school district of Princeton, New Jersey (which includes Princeton University) and Trenton, NJ—the state capital, only 5 miles away. There is a cache to Princeton, NJ. Its family-educated children, personal safety, excellently maintained facilities, and the prestige associated with being employed by the system leads many teachers to want to work there—even at a salary below some other school systems. However, Trenton, NJ is a typical urban school district—even with high teacher salaries the district has difficulty attracting and retaining teachers who are comparable to those in Princeton.

Adjusting for inflation differences in education may be easier, however, than adjusting for geographic differences. Most of the inflation adjustments yield similar results (the exception being Rothstein's). On the other hand, there may have been quality substitution changes in education that are comparable to those suggested above for automobiles. If so, additional work is needed in understanding what the effect of those quality changes has been. Fowler and Monk conclude that there are two primary goals for the future of education cost adjustments: improving the mechanisms for making the adjustments, as well as educating the public and policymakers about any progress that has been made.

Another of the troubling measurement issues facing the education finance community is how to assess the financial condition of public school districts. Dean Michael Mead of the Governmental Accounting Standards Board (GASB), first defines financial condition in a broad manner:

> Financial condition is the ability of a school district to meet its obligations as they come due and to finance the services its constituency requires.

Many things, including the health of the local economy, the wishes of the citizens, and the school district's political landscape, determine this "barometer" of a school district's fiscal health. Mead provides an overview of the financial information to consider when determining a school district's financial condition, particularly information from a district's annual financial statements.

The first tools that Mead considers are common-size ratios, such as the percentage change and percentage distribution. For example, did outstanding debts grow or shrink? Was state aid a larger or smaller share of revenue? These provide a quick overview of the finances of a district and how they have changed. Another concern is liquidity and solvency, the school district's ability to pay its bills in the short and long run, respectively.

The current ratio (assets/liabilities) can be used to assess the district's ability to raise resources to cover its obligations. A more rigorous approach to liquidity (ability to pay bills in the short run) might be the quick ratio, which compares only the most liquid assets of a school district (cash), to its liabilities. Some districts do not include any long-term debt in their quick ratio. The determination of what is an acceptable level of liquidity is subjective, but 1.0 leaves no room for unforeseen demands for cash. Thus, most prudent people would require a quick ration of 1.5 or greater.

Solvency ratios come in two forms, leverage ratios and coverage ratios. Leverage is the degree to which a district's assets are financed through borrowing and other long-term obligations. For example, a debt-to-net asset ratio of .55 means that for every dollar of resources the district has available to use for providing public services, it owes 55 cents.

Fiscal capacity is the concept of a district's ability to raise resources to finance the provision of the services its constituency demands. These ratios compare revenues, expenses, and outstanding debts with indicators that imply a constituency's ability to pay for services. Property tax revenues per $100 of assessed value, or an effective tax rate are examples. The risk and exposure of school districts can be measured through revenue dispersion. For example, if most of a school district's funds come from the state, it is more vulnerable to the shock of a reduction from the state.

Mead concludes that the financial statements are only one source of information that is relevant to assessing a school district's finances. School district employee pensions, often the largest long-term obligations, may not appear in these reports. In addition to knowing a district's capacity to raise resources and to provide services it is also important to know its willingness to do so.

A new development in education finance has been a focus on school-level resources. Traditionally, financial reporting has been a school-district level responsibility, whether to the federal government, the state, or to the public. However, more than a third of states (19 states) now report that they require school-level expenditure reporting. Since there are some 83,000 regular public schools in the United States, one can quickly see the difficultly of even the federal government collecting and reporting their finances. Typically, the method for school-level financial reporting is a simple downward accounting extension (DAE) of what is done at the school district level. **William T. Hartman**, Pennsylvania State University, **Denny G. Bolton**, Owen J. Roberts School District, and **David H. Monk**, Pennsylvania State University, explore the traditional DAE method with an alternative method of financial reporting, the resource cost model (RCM), which focuses on the use of resources (particularly staff allocation). They then go on to suggest a synthesis of the two approaches.

The first question that Hartman, Bolton, and Monk address is the consideration of who will be the primary users of school-level data, what new data they need, and for what purposes. They suggest four sets

of principal stakeholders: schools and school districts; state and national policymakers; researchers and policy analysts; and the public, represented by parents and taxpayers, special interest groups in education, and the financial community. One of the primary responsibilities of school and school district administrators, as well as school boards, is fiscal management and financial compliance. School-level data would allow state and federal agencies to monitor the achievements of schools in closer detail.

Hartman, Bolton, and Monk find school-level data of three main types: actual expenditures and costs, staff, and students. Frequently, schools do not integrate these school-level databases into a single, comparable database. Unfortunately the availability of staffing data and the ability to track staff information to the school level will vary by state and school district. Staff information usually includes assignment, location, professional qualifications, current salary and benefits. Student data is typically enrollment, although performance measures are becoming more common. The typical financial reporting scheme is function (i.e., instruction), by object (i.e., salaries), and program (i.e., special education) (Fowler 1997).

The DAE approach reports expenditures at the level of *individual schools*. The RCM approach uses an economic basis for establishing costs of *educational programs*. Hartman, Bolton, and Monk assert that "both the accounting approach and the RCM approach face common issues that need to be resolved regardless of which system would be utilized." These include the definition of a school; what is included in expenditures; how to conduct allocation procedures, for example, when a principal also teaches two classes a day; counts of the number of students served, and perhaps their learning outcomes. However, Hartman, Bolton, and Monk also find areas of differences between the RCM and DAE approaches, including whether to focus on expenditures or staffing resources, the unit of analysis (school or classroom), the timing of the data collection, the difficulty of the collection (RCM is generally regarded as the more difficult approach), startup costs and ongoing collection cost burdens, and the usefulness and limitations for analysis.

In order to achieve a synthesis of the two approaches, Hartman, Bolton, and Monk sagely focus upon the positive aspects of each approach while avoiding some of the difficulties of each. The DAE approach is recommended for obtaining expenditure data at the school level. The RCM approach is recommended for collecting school-level staff data. They do not recommend that district level expenditures, such as busing students, be allocated to schools, but, rather, simply not reported at the school level, stating:

> Along with student data, the accounting and RCM approaches provide many more opportunities for perceptive and beneficial uses of the data than either approach alone.

In summary, Hartman, Bolton, and Monk assert that the synthesis of DAE and RCM results in both financial and personnel resource information at the school level. Having school-level expenditure information permits management control over operations and comparisons among schools. Personnel allocations yields program costs and operations, as well as effectiveness. The DAE approach fits the needs of school and district administrators and school boards to maintain fiduciary responsibility for public funds. The RCM approach permits insight into the effectiveness of different instructional approaches and their costs. The use of both approaches permits the attainment of all of these financial reporting objectives.

As always, readers are urged to visit the NCES elementary-secondary education finance Web site, http://nces.ed.gov/edfin for the latest NCES publications and information in the area of school finance.

## References

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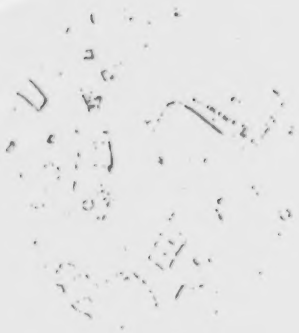

# *How Has Teacher Compensation Changed?*

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Dan D. Goldhaber
The Urban Institute

## About the Author

Dan D. Goldhaber is a Senior Research Associate at the Education Policy Center, Urban Institute, Washington, DC. He is an economist who specializes in the economics of education and education finance. His research focuses on issues of educational reform and productivity at the K–12 level, and the relationships between teacher labor markets and teacher quality. Topics of recent published work include: the effects of teacher qualifications and quality on student achievement; the relative efficiency of public and private schools; and policy analyses of market competition, in the form of education vouchers, on K–12 schooling. Publications on these topics have appeared in the *Journal of Human Resources*, the *Journal of Urban Economics, Economics of Education Review, Journal of Education Finance, Education Economics, Education Matters, Industrial and Labor Relations Review, Educational Evaluation and Policy Analysis, Education Researcher,* and *Phi Delta Kappan.*

Dr. Goldhaber is currently conducting research addressing the effects of the Florida Opportunity Scholarship (voucher) Program on schools, teachers, and students. Other research includes an impact study of the implementation of various comprehensive school reform models, and analyses of the effects of National Board certification on teachers and students in North Carolina.

Prior to joining the Urban Institute, Dr. Goldhaber served as the Assistant Director for Education at the CNA Corporation on Alexandria, VA. Dr. Goldhaber is also an elected member of the Alexandria City School Board where he has served since 1997 and an adjunct faculty member at the Georgetown University Public Policy Institute. He received a BA from the University of Vermont and an MS and Ph.D. in Labor Economics from Cornell University.

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## Introduction

How has teacher compensation changed? The answer to this question is of crucial policy significance to researchers attempting to assess the relationship between teachers' salaries and benefits, teacher quality, and ultimately student outcomes; and to policymakers trying to craft effective teacher compensation policies. This question is also particularly pertinent at this point in time as school systems struggle to find the large numbers of new teachers that will be needed to account for increasing student enrollments and an aging teaching labor force (Lankford and Wyckoff 1997).

It is clear that over the long term, relative teacher compensation plays an important role in influencing the decision to enter and leave the profession. Expressed interest in teaching as a career tends to track closely with fluctuations in relative teacher salaries. For instance, median starting salaries in education lost ground (in both real terms and relative to most other fields of study) in the 1970s through the mid-1980s (U.S. Department of Education 1997). During this period, the percentage of freshman reporting an interest in a (elementary or secondary) teaching career declined from over 20 percent in the late 1960s to a low of 4.7 percent in 1982 (Astin et al. 1997). Since then, both salary and career interest in teaching has recovered somewhat, but it has remained significantly below the 20 percent level. This fact provides some indication that individuals are influenced by long-term labor market incentives when making career choices. All else equal, as teachers' salaries and benefits rise relative to those in other professions, teaching becomes a more attractive field and higher ability individuals will enter the profession.

Given that the level of compensation in an occupation plays an important role in attracting or dissuading able individuals from entering and exiting that occupation, the question is, "How has compensation in teaching changed?" The answer to this question is more complicated than one might initially imagine. For instance, based on data from the U.S. Bureau of the Census (1999), we know that between 1980 and 1997 teachers' salaries rose by roughly 120 percent. This statistic might indicate to many that teaching is an attractive pro-

fession in which to be. However, though the increase may sound strikingly large, this fact alone does not provide a good indication of how financially attractive it is to be a teacher. For instance, the 120 percent increase in salaries is only equivalent to a 19 percent increase once adjustments are made for inflation. During this same period salaries overall increased by 29 percent (U.S. Bureau of the Census 1999).[1] Thus, when judged by salary alone, teaching is a less attractive occupation to be in today than it was in 1980. This example illustrates the difficulty, given contemporaneous changes in cost of living and compensation in other fields, in determining precisely how compensation changes for teachers changes the incentives to enter or remain in teaching.

Recent research provides strong evidence that teacher quality is the single most important school factor affecting student achievement.

This paper compares and contrasts several alternate measures of teacher compensation over time, focusing on how teacher compensation has changed relative to compensation in the labor market as a whole and changed relative to specific professions that compete with teaching for college graduates.[2] Specifically, data from the Bureau of Labor Statistics' employment cost index (ECI) are used to make these comparisons over time and, where applicable, compare the findings with other data detailing changes in educational costs. Further, the implications of these findings in relation to the anticipated shortage of teachers over the next decade are discussed.

This paper is laid out in four sections. The first section provides motivation for this topic by providing an overview and brief review of the existing empirical literature linking teacher quality and teacher compensation.[3] The second section focuses on the structure of compensation in teaching and how it compares with the structure of compensation in other sectors of the economy. This section helps to frame the issues by shedding light on the relative attractiveness of entering teaching for individuals with different backgrounds and credentials. In the third section, data on changes over time in teacher compensation are presented and compared with changes in educational costs and to compensation in other fields. The implications of these changes are discussed in the final section, which also focuses on the changing incentives to enter and remain in teaching for individuals with different backgrounds.

## Teacher Quality and Compensation

Recent research provides strong evidence that teacher quality is the single most important school factor affecting student achievement. Both Wright, Horn, and Sanders (1997) and Rivkin, Hanushek, and Kain (1998) find there is a wide range of effectiveness among teachers and that teacher quality accounts for a much larger share of the total variation in student achievement than all other educational resources. Studies tend to show that teachers who score higher on standardized exams and attend more selective colleges tend to be more effective (Ehrenberg and Brewer 1994, 1995; Ferguson 1991, 1998; Strauss and Sawyer 1986). Research also shows that teacher preparation in mathematics and science has a positive impact on student achievement in those subjects (Monk and Rice 1994, Goldhaber and Brewer 1997). Thus, if we are to define "teacher quality" according to quantifiable attributes that impact student outcomes, three measures that would appear to serve as good indicators of quality include degree in subject, performance on standardized exams, and selectivity of college attended.

[1] In nominal terms, salaries rose from $17,644 in 1980–81 to $38,509 in 1996–97. Adjusted for inflation this is equivalent to a real increase of about $6,000 (in 1996–97 dollars).

[2] The focus in this paper is on public school teachers so, except where explicitly noted, teachers and teacher compensation will refer to public school teachers and compensation in the public sector.

[3] "Compensation" generally refers to both pay and benefits; here, however, unless otherwise noted, we use the terms "teacher compensation," "teacher pay," and "teacher salary" interchangeably.

These findings are important because they suggest that teachers can have an important impact on students' achievement and there are particular attributes or credentials that school systems may look to in trying to recruit successful teachers. However, it appears that the most important teacher attributes are difficult to identify in data. For instance, the ability of teachers to convey knowledge or their enthusiasm for class material might have a dramatic impact on students, but these characteristics are difficult to quantify and may not be related to identifiable characteristics that are more easily measured. Goldhaber, Brewer, and Anderson (1999) investigated the contributions of school, teacher, and class characteristics on student achievement. They found about 3 percent of the contribution teachers make toward explaining student achievement is associated with teacher experience, degree level, and other readily observable characteristics. The remaining 97 percent is made up of teacher qualities or behaviors that could not be separately isolated and identified.

Several studies investigate the relationship between the selectivity of college attended and the subsequent labor market outcomes of teachers. Both Ballou (1996) and Chambers (1998) find that teachers graduating from more selective colleges receive higher salaries.[4] Figlio (1997) finds that school districts that offer higher salaries are more likely to hire teachers from selective colleges. However, Ballou (1996) finds that in teaching, unlike in other fields (e.g.; engineering, accounting, business administration, computer science, and psychology) graduating from a "selective" college (the top of four college quality categories) does not have a statistically significant impact on the probability of finding a job in one's field of study. In addition, relatively few studies have found a direct link between teachers' salaries and student outcomes (Hanushek 1986, 1997).

One possible explanation for these somewhat mixed findings is that there is not a strong demand for high quality teachers. Higher salaries may attract a larger pool of qualified job applicants, but if school administrators do not prefer stronger job candidates, the quality of the teacher workforce may not improve (Strauss et al. 1998).[5] For instance, despite the fact that having a degree in subject is a better predictor of teaching proficiency than a degree in education (Goldhaber and Brewer 1997, 1998), individuals who wish to teach in mathematics or sciences in high school are better off majoring in education with a teaching field in mathematics or science than completing an academic major in those subjects (Ballou and Podgursky 1997). Additionally, both Ballou (1996) and Manski (1987) find that increases in teachers' salaries increase the applicant pool of new teachers but do not affect the ability distribution of teachers.[6]

It is also possible that researchers investigating the relationship between teachers' salaries and teacher quality and student outcomes have failed to adequately account for important non-pecuniary job characteristics that are positively correlated with the attractiveness of a teaching job but negatively correlated with teachers' salaries.[7] Ballou (1996) finds that graduates of better colleges are more likely to be found in

Several studies investigate the relationship between the selectivity of college attended and the subsequent labor market outcomes of teachers.

[4] Ballou (1996) estimates a salary advantage of about 6 percent in teaching for those that fall into the highest college quality category rather than into the lowest.

[5] Also, Ballou and Podgursky (1995) show, from a theoretical perspective, that it is possible for increases in salary to result in a decline in the quality of the teacher workforce. They find that the pool of teacher applicants will rise with salary increases. However, current teachers may also elect to stay longer in teaching, reducing the number of available teaching slots. This, in turn, lowers the probability of obtaining a job in teaching which may have the biggest impact on high quality applicants who have attractive alternatives to teaching.

[6] A study of public school districts in Pennsylvania suggests that school districts may not actively search for or screen teacher applicants (Strauss et al. 1998). For instance, most school districts were not found to advertise or look outside of the local labor market to find new teachers (only 25 percent of school districts advertised outside of the state, and, on average, 60 percent of newly hired school teachers came from institutions no more than 70 miles away from the hiring school district).

[7] For instance, teachers' salaries in New York City are significantly higher than teachers' salaries in most parts of Iowa; however, much of the higher New York salary must be considered a compensating differential for a higher cost of living and a greater at-risk student population.

schools with smaller percentages of poor students and higher percentages of students bound for college. Chambers (1998) shows that there are large compensating differentials for community characteristics, such as cost of living, crime rates, and weather. Loeb and Page (1998), who focus on this issue, find a strong relationship between teachers' salaries and high school dropout rates and the likelihood of college attendance, only after carefully controlling for non-pecuniary school district characteristics.

A final possibility is that studies have failed to adequately account for alternative labor market opportunities for teachers. Many "teacher salary-teacher quality" studies do not measure teachers' salaries relative to wages in other occupations,[8] which is a potentially important omission since economic theory predicts that increases in salary would attract more qualified individuals into a particular field *only if salaries in that field were rising relative to what individuals could make in other areas.* The select few studies that do control for alternative labor market opportunities (see, for instance, Ballou and Podgursky 1997; Flyer and Rosen 1994; Hanushek and Rivkin 1997; Loeb and Page 1998; Hanushek, Kain, and Rivkin 1998) treat all teachers as if their opportunity costs are the same regardless of field of specialization or quality of college attended.

Teacher quality is difficult to predict when evaluating teacher candidates and performance on the job is difficult to measure.

One of the primary reasons that previous studies have failed to account for some of the factors that likely affect studies of the relationship between teacher compensation and teacher quality is lack of adequate data. The primary problem is that sample sizes are usually not large enough to disaggregate the data enough to make "ideal" comparisons between individuals who enter teaching to those with similar backgrounds (e.g., college quality and major) who enter an alternate occupation. Given that we will encounter some of the same difficulties here, it is important to keep these facts in mind as we go on in subsequent sections of this paper to discuss how teacher compensation has changed relative to that in other occupations. In particular, although the attractiveness of teaching as a profession is likely to rise or fall with overall increases in relative teacher compensation, it is not likely to be the same for individuals with different backgrounds. These subtleties are discussed at greater length in subsequent sections.

## The Structure of Teacher Compensation

Teacher quality is difficult to predict when evaluating teacher candidates and performance on the job is difficult to measure. For these reasons teacher compensation is often linked to credentials that may serve as indirect indicators of knowledge and skills, rather than determined on an individual by individual basis. In fact, most, but not all, public school systems use the "single" or "uniform" salary schedule to determine how much a teacher will earn (Odden and Kelley 1997).[9] Such a schedule typically sets teacher pay solely on the basis of teaching experience and teacher degree level.[10] The average pay premiums for advanced degrees are about 11 percent for a master's degree, 14 percent for an education specialists degree, and 17 percent for a doctorate degree (U.S. Department of Education 1996b). The premium for an additional year of service is typically between $1,000 and $1,500 (Odden and Kelley 1997).

[8] See Loeb and Page (1998) for a more detailed discussion on this topic.

[9] The uniform salary schedule dates back to 1921 when Denver, Colorado and Des Moines, Iowa became the first cities to adopt it. By the 1950s, 97 percent of school districts had adopted this pay structure (Odden and Kelley 1997) and today approximately 95 percent of school districts structure compensation in this manner.

[10] This is despite the fact that there is relatively little quantitative evidence that teacher experience and degree level, per se, are correlated with student outcomes (Murnane 1996; Hanushek 1986, 1997; Ballou and Podgursky 1997; Goldhaber and Brewer 1998).

Though it is far from the norm in public schools, there is some differentiation in compensation structure across districts. For instance, there has been an increase in recent years in the number of public school districts that use pay incentives to recruit (or retain) teachers to teach in less desirable locations or in fields of shortage.[11] Some states and localities have also experimented with various performance-based pay systems, such as merit pay, the formal linking of individual teachers' salaries to individual teacher performance.[12] Though this has been tried in a number of localities, these efforts have been viewed by many to be unsuccessful and have largely been short-lived (Hatry, Greiner, and Ashford 1994; Murnane and Cohen 1986).[13]

More recently, states and localities have opted for a group-based approach to performance pay. South Carolina and Tennessee, for example, have developed systems where schools are rewarded with additional funding based on the performance of students in the school (Clotfelter and Ladd 1996, Odden and Kelley 1997). Although they differ from one another in some respects, these systems compare school-wide gains in student scores over time to what econometric models would predict the gains to be after controlling for students' demographic characteristics.[14] Still, these performance-based systems represent the minority of school systems' pay structures.

Given that pay is determined by degree and experience level in most school systems, there is little ability for school systems to differentiate pay at the individual level in order to pay for teacher attributes such as performance, field of specialization, quality of college, grades in college, academic or other awards, or standardized test scores.[15] For this reason, the structure of compensation in teaching is quite different than the structure of compensation in the private sector as a whole. For instance, salaries in the private sector are thought to reflect college quality (Brewer, Eide, and Ehrenberg 1999),[16] standardized test scores (Murnane, Willett, and Levy 1995), and the supply and demand conditions for particular fields or occupations (Grogger and Eide 1995, Freeman 1976). Pay for performance is also quite common in some occupations, such as sales where commissions determine a large share of total compensation.[17] Bretz and Milkovich (1989) estimate that 93 to 99 percent of private sector firms use some type of pay for performance plan for salaried employees. There has recently been increased use of plans, such as profit sharing and employee stock ownership, that formally link pay and performance for all types of employees.[18] Studies tend to show that these compensation strategies do lead to

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[11] From 1987–88 to 1993–94, the percentage nearly doubled from 8 to 15 percent for all districts (U.S. Department of Education 1998b).

[12] Economists have long theorized that connecting compensation to performance should elicit higher levels of effort and productivity (Pencavel 1977, Brown 1990).

[13] Despite the fact that economic theory might predict merit pay to be a successful strategy to use in schools, many argue that this private sector model cannot work in education because both the process used and the product produced are not well defined. For instance, teachers may use many different strategies to achieve multiple educational objectives. This may make it difficult to accurately assess their level of effort or value added. Additionally, pay for performance may be more difficult to implement successfully in large organizations (Lawler 1981, Deming 1986, Rainey 1990).

[14] An assessment of a similar accountability program in place in the Dallas Independent School District suggests that this type of reform can have a relatively small, but statistically significant positive impact on student achievement (Clotfelter and Ladd 1996).

[15] However, this does not necessarily mean that these characteristics are not rewarded in teacher labor markets. For instance, it is possible that no single school system differentiates pay based on college quality, but teacher candidates from higher quality colleges are systematically more likely to obtain jobs in high paying school districts, implying an unequal distribution of teacher skills across school districts (Ferguson 1998).

[16] As a particular example, the median starting salary for an MBA from the program ranked 1st, Harvard University, was $82,000 in 1997 compared with only $64,000 for the program ranked 25th, Vanderbilt University (U.S. News and World Reports 1998).

[17] Economists have long theorized that connecting compensation to performance should elicit higher levels of effort and productivity (Pencavel 1977, Brown 1990). It may also assist in attracting and retaining high quality employees (Milkovich and Wigdor 1991).

[18] For a review of performance-based pay, see *Paying for Productivity: A Look at the Evidence* (Blinder 1990).

higher levels of productivity (Mitchell, Lewin, and Lawler 1990;Weitzman and Kruse 1990).

Since the broader labor market appears to financially reward characteristics that school systems do not (at least explicitly), individuals who graduate from more selective colleges, and who have degrees in fields in high demand likely sacrifice more financially to enter or remain in teaching—an important point to consider when comparing compensation in teaching with compensation in other fields. That is, the significant differences in pay structure between teacher labor markets and private sector labor markets imply that the incentives to enter, and costs to stay in teaching careers, may vary considerably from field-to-field and individual-to-individual.

Ideally, in making compensation comparisons we would like to be able to observe the compensation of individuals who are at similar points of their career.

Several other considerations are important to highlight prior to comparing compensation in teaching with that in other fields. First, yearly compensation in teaching is based on a contract year that is generally 180 to 200 days. Thus, to be comparable to most other occupations the yearly salary would have to be scaled to a standard work year. Because the contract year for teachers has for most part remained constant over time, it is not necessary to make this adjustment in order to make judgements on how relative teacher compensation has changed.

In addition, when comparing average salaries in teaching with those in other occupations, it is worth considering the fact that averages are influenced by both changes in the structure of salaries (i.e., the magnitude of raises at each salary step), as well as the hiring decisions of school systems and changes in the demographic composition of teachers. Some school systems may choose to hire senior, highly-credentialed staff, while others choose to hire more junior, less costly staff. For instance, two school districts may have school systems that have equivalent salary schedules but have very different average salaries based on where teachers fall on the salary schedule in terms of degrees and years of teaching experience. Lankford and Wyckoff (1997) show that, in increasing salaries in the 1980s and early 1990s, many school districts "backloaded" salaries—that is, they allocated a great deal of the overall resources used to increase salaries toward increasing salaries of relatively experienced teachers. Depending on how new entrants into the labor market value starting compensation versus compensation in mid- and late-career, these increases may have had little impact on attracting able college graduates into teaching.

Ideally, in making compensation comparisons we would like to be able to observe the compensation of individuals who are at similar points of their career. For instance, a teacher who has 10 years of post-baccalaureate experience earns $X versus an engineer with 10 years of post-baccalaureate experience who earns $Y. In practice, this type of detailed comparison at multiple points of a career is not possible given data constraints; however, starting salaries provide a good benchmark for the attractiveness of an occupation and existing data do allow for a comparison between occupations in starting salaries. Thus, in the following section, we focus not only on changes in averages both within and outside of teaching, but also on how starting salaries have changed over time.

## Changes in Teacher Compensation

Over the past two decades, a number of highly publicized reports, such as National Commission on Excellence in Education (1983), the Carnegie Forum on Education and the Economy (1986), and the National Commission on Teaching and America's Future (1996), included among their recommendations, raising teachers salaries. The argument for this recommendation is that, all else equal, higher salaries should attract more qualified individuals into teaching. Researchers and policymakers may differ about the need for higher salaries based on disagreements over how ef-

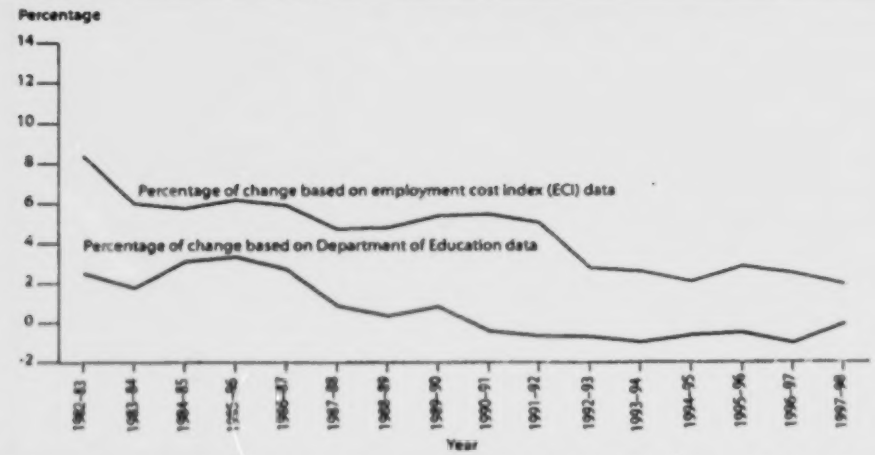
fectively additional monies spent on teachers have been used to attract high-quality people into teaching.[19] However, it is surprisingly difficult to gain a full understanding of how teachers' salaries have changed relative to inflation and salaries in other occupations, thus part of the debate may be shaped by the comparisons that are made in assessing changes in salaries.

In this section of the paper, data and research drawn from several sources present a comprehensive picture of how teachers' salaries and benefits have changed in the past two decades and the implications of this change. In particular, comparing various measures of change to see whether they tend to present the same picture of change. Where appropriate, the shortcomings of available data or the approach taken are also noted. The first subsection begins with a discussion of teacher benefits. Unfortunately, due to a lack of available data, relatively little information is available at a disaggregated level on the magnitude of change in benefits over time; thus this subsection deals primarily with changes in aggregate spending on benefits. Significantly more data are available on changes over time in average teachers' salaries, which is discussed in the next subsection. However, as noted above, averages reflect choices that are made by school districts as well as changes in the demographics of the teacher labor force; thus the final subsection focuses on changes over time in teachers' starting pay.

## Benefits

In most school systems, benefits constitute an important part of the overall compensation. Figure 1 shows the amount spent on benefits for instructional staff (represented by the broken line and the right hand Y-axis) as well as the percentage of total instructional expenditures for public elementary and secondary education that is devoted to employee benefits (represented by the solid line and the left hand Y-axis). The figure indicates that spending on benefits has increased significantly throughout the 1990s, from about $20.7 to $30.3 million or roughly 46 percent. However, given inflation and the fact that this corresponds to a period when more teachers were be-

Figure 1.—Dollars and percentage spent on employee benefits




SOURCE: U.S. Department of Education. 1999. *Digest of Education Statistics, 1998*. Washington, DC: National Center for Education Statistics (NCES 1999–036).

[19] Teachers' salaries and benefits represent by far the largest expenditure category for K–12 schools. Teachers' salaries alone typically make up over half of school district budgets (Chambers 1997) and salaries and benefits combined generally make up over 80 percent (U.S. Department of Education 1998a). See Hanushek (1986) or Ballou and Podgursky (1997) for a discussion of why these expenditures may not have attracted high quality individuals into teaching.

ing hired, it is not necessarily a good indication of benefits levels for individuals.[20]

To gain a better perspective of how actual benefits have changed, it is useful to examine data from the Schools and Staffing Survey. These data indicate that almost all public school districts offer teachers retirement packages and medical insurance.[21] Dental insurance (about 67 percent), life insurance (about 71 percent), and other in-kind benefits (e.g., meals, transportation, tuition reimbursement, etc.) are less widely offered. Data from the 1987–88, 1990–91, and 1993–94 waves of the survey show there has been a slight increase in the percentage of school districts that offer benefits, particularly retirement and in-kind benefits.[22] (However, some of the reported increases may be a result of rewording of questions on surveys).[23]

The first step in assessing how financially attractive it is to be a teacher today compared with earlier years is to see how salaries have changed in real terms.

Based simply on the availability of coverage (e.g., whether there is a retirement or health plan), the benefits available to teachers appear to be roughly comparable to those available to full-time employees in state and local governments and they exceed the coverage offered to those employed in small private establishments or the private sector as whole (Bureau of Labor Statistics 1995, 1998b) For instance, in 1993–94 only 50 percent of private sector workers were covered by a retirement plan (Foster 1997).

The Schools and Staffing Surveys, which are probably the best source of information on teacher benefits, only provide information on the incidence and provisions of selected benefits, thus no information is available on the generosity of benefit packages. For instance, we do not know what the breakdown is between employee and employer contributions for health care coverage or the specifics of retirement packages. The Bureau of Labor Statistics collects slightly more detailed data in their *Employee Benefits Survey,* however, at this point the survey does not include teachers as a separate category.

The fact that benefits as a percentage of instructional expenditures have been increasing does suggest that, from an institutional perspective, benefits represent a larger fraction of overall compensation for teachers. However, this increase may not be perceived as an enhanced benefit by teachers given that the costs of providing some benefits, particularly medical insurance, increased substantially during this time period. For instance, between 1981 and 1997, the rate of increase in benefits outpaced the rate of increase of wages and salaries by 34 percentage points for all civilian workers (Bureau of Labor Statistics 1998a, 1998b). Thus, the increased expenditure may not correspond well with the actual services that teachers receive.

As a result, while the existing data sources appear to show that benefits for teachers compare favorably to those in the private sector, it is not possible to directly compare how they have changed over time relative to the private sector. Thus, there is no indication of whether teaching has become a more or less attractive occupation given changes in benefits. Fortunately, far more detailed data exists on teachers' salaries, which are explored below.

## Average Salaries

The first step in assessing how financially attractive it is to be a teacher today compared with earlier years is to see how salaries have changed in real terms. This information is provided in figure 2, which presents average teachers' salaries, both un-

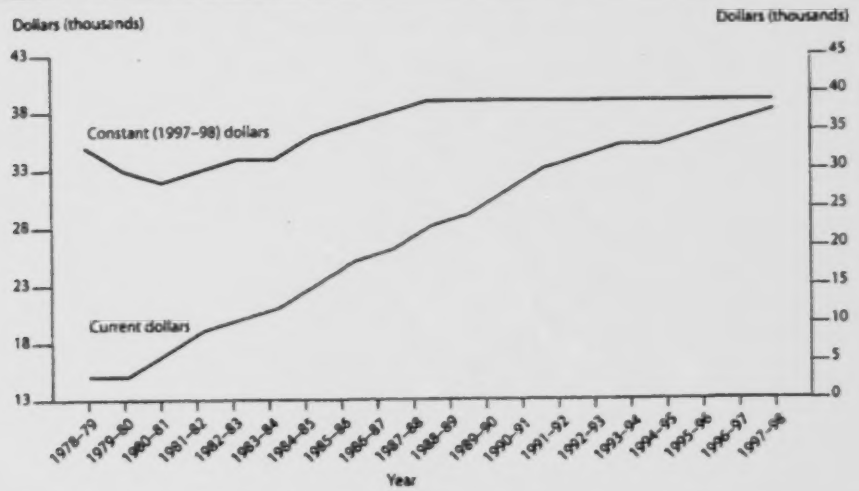
[20] Also, these figures represent expenditures for all public school employees that fall under the heading of instructional staff, not teachers only.

[21] About 99 percent of districts offer some type of retirement plan and 96 percent of districts offer medical insurance.

[22] For instance, in 1987–88, 56.4 percent of school districts reported offering benefits, but this percentage rose to 69.1 percent in 1990–91.

[23] For a more detailed description of changes in the survey questions, see *Schools and Staffing in the United States: A Statistical Profile, 1990–91* (U.S. Department of Education 1993a).

Figure 2.—Average teacher salaries




SOURCE: U.S. Department of Education. 1998. *Digest of Education Statistics, 1997.* Washington, DC: National Center for Education Statistics (NCES 98–015).

adjusted (current dollars) and adjusted (constant dollars) for inflation. Unadjusted teachers' salaries increased by 136 percent in the last two decades (from 1978–79 to 1997–98); however, in real terms (in constant 1997–98 dollars), this actually represents only a modest 11 percent increase.[24] In fact, as the trend line for inflation adjusted salaries indicates, the real purchasing power of teachers' salaries actually declined between 1978–79 and 1980–81. It recovered and rose somewhat over the next ten years but has remained relatively flat through much of the 1990s.

It is important to remember that pay scales in public schools are generally set via a salary schedule and are thus greatly influenced by the hiring decisions of school systems (i.e., the credentials of the teachers hired). Additionally, productivity growth in service industries, such as education, is typically slower than in other sectors of the economy. Thus, salaries may rise (with productivity growth) in some sectors of the economy without causing commensurate increases in output prices (inflation). This means inflation in the prices of educational inputs may exceed that calculated by an economy-wide measure, such as the consumer price index (CPI), which is used to deflate salaries in the graph above. For instance, the use of a general gross domestic product (GDP) deflator would tend to overstate the investment in education in terms of the quality of labor purchased.[25]

For these reasons, the CPI may not be the most appropriate statistic to use in adjusting teachers' salaries for inflation. Several alternative price deflators are used to assess the degree to which the magnitude of change in real teacher salary is determined by the salary deflator that is chosen. Although the specifics of the various deflators employed here are not discussed, the net services index (NSI), Chambers' teacher cost index (TCI), and Goldhaber's general wage index (GWI), each is designed (using different methodologies)to account for

[24] This is average compensation for all elementary and secondary teachers (U.S. Department of Education 1999).

[25] For a discussion of this, see Rothstein and Mishel (1997).

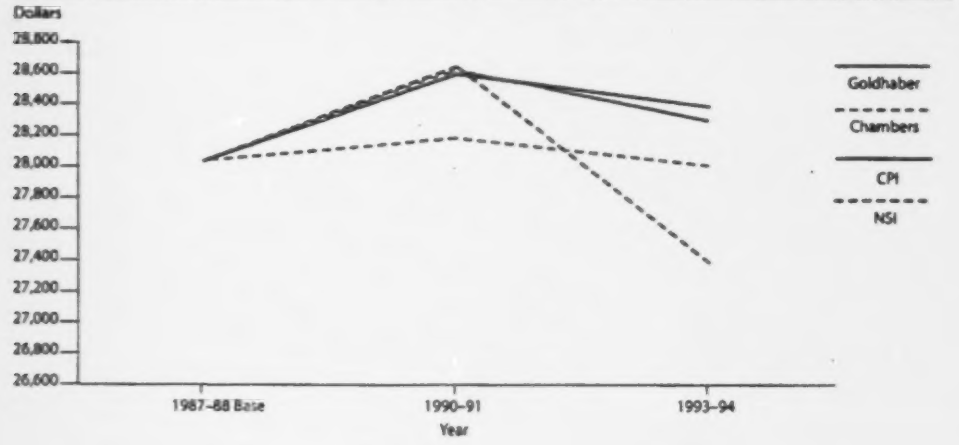
(some or all of) the potential shortcomings of the CPI in adjusting for inflation in teachers' salaries.[26]

Figure 3 shows a comparison of average teachers' salaries (in 1987–88 dollars) deflated using the CPI to salaries deflated using the other indices. The years 1987–88, 1990–91, and 1993–94 are chosen because they correspond to the years for which the Chambers TCI[27] and Goldhaber GWI are available.[28]

The use of different price deflators does, in some cases, have a relatively significant impact on the calculation of real teachers' salaries. For instance, the difference between the NSI and the Goldhaber GWI in 1993–94 is about $1,000. Still, the difference are not so pronounced so as to change the overall pattern showing a rising salary from 1987–88 to 1990–91 and a falling salary from 1990–91 to 1993–94. These differences, however, do indicate that there may be important differences in productivity between education and other sectors of the economy. This, in turn, implies it is quite important when investigating the relative attractiveness of teaching to compare teachers' salaries to salaries in other occupations that directly compete for teachers in the labor market.

Such a comparison is drawn from data collected for and prepared by the Bureau of Labor Statistics (BLS) Office of Compensation and Working Conditions. The ECI measures changes over time in compensation costs which include wages, salaries, and employer costs for employee benefits in organizations of all sizes in private industry and the public sector throughout the United States (it also allows researchers to separately obtain data on average employer costs per hour worked for wages and salaries). The data is organized by "series"

Figure 3.—Average salaries using different price deflators




SOURCE: Author's calculation based on data from U.S. Department of Education. 1998. *Digest of Education Statistics, 1997*. Washington, DC: National Center for Education Statistics (NCES 98–015); Chambers, Jay G. 1998. *Geographic Variations in Public Schools' Costs*. Washington, DC: U.S. Department of Education, National Center for Education Statistics (NCES Working Paper 1998–04); and Goldhaber, Daniel D. 1999. "An Alternative Measure of Inflation in Teachers' Salaries." In William Fowler, Jr. (ed.), *Selected Papers in School Finance 1997–99*, Washington, DC: U.S. Department of Education, National Center for Education Statistics (NCES 1999–334).

[26] For a review of this issue and description of the various methodologies, see Rothstein and Mishel (1997), Chambers (1997), and Goldhaber (1999).

[27] Chambers' TCI is the teachers' salary component of his cost of education index.

[28] These two indices were calculated using the *Schools and Staffing Survey* which was only available in select years.

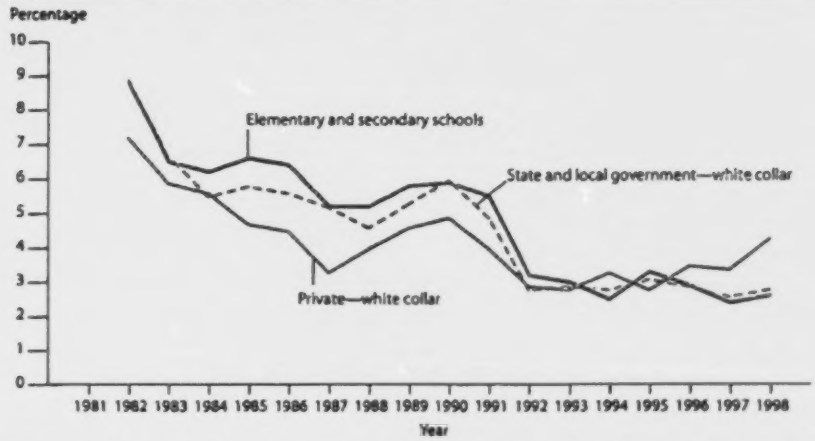
which constitute different segments of the economy (e.g., "all workers," "white collar workers," "service occupations," and "union workers"). One of the series included in the survey is elementary and secondary schools (ESS). This series provides an excellent opportunity to compare, over a relatively long period of time, how average salaries in education have changed relative to those in other sectors of the economy (for readers who are not familiar with this survey, more information is presented in appendix A).[29]

The ECI data are used to show how average teachers' salaries have changed relative to salaries in sectors of the economy that compete in the labor market for teachers. Specifically, a comparison of the index of wages and salaries in the ESS series to wages and salaries for all civilian workers, all workers in private industry, all workers in state and local government, white-collar workers in private industry, white-collar workers in state and local government, civilian workers in service occupations, and private industry workers in service occupations (occupations likely to draw from the same labor pool).

Each index is normed such that (June) 1989 equals 100. Thus, it measures salaries in each series relative to the value of salaries in that series in 1989.[30] This allows for a comparison of salary growth rates in different sectors of the economy. Figure 4 shows the growth rate of the wage and salary index in the ESS series to the indices for private white-collar workers and state and local government white-collar workers.

This graph shows that growth rates in the ESS series exceeded those in other series for most of the 1980s and 1990s. This conflicts slightly with the impression from figure 2 which shows real teachers' salaries stagnating for most of the latter 1980s and early 1990s (this pattern holds for all eight series and for total compensation, both of which are shown in appendix B).[31] However, it corresponds closely with data re-

Figure 4.—Growth rate in wages and salaries




SOURCE: Author's calculation based on data from Bureau of Labor Statistics. 1999. *Employment Cost Trends, 1999.* http://stats.bls.gov/ectserie.htm.

[29] The "elementary and secondary schools" series includes a broader class of employees than teachers alone, which means it may not correspond well to the data presented in figure 1 on average teachers' salaries. As shown in appendix B (figure B-1), the inflation rate in real teachers' salaries as calculated using the ECI consistently exceeds the inflation rate as calculated using data from the Department of Education. However, the year-to-year changes in inflation track very closely.

[30] For example, if in 1982 salaries in the ESS series were $25,000 and salaries in the private white-collar sector were $35,000, and in 1989 salaries in the ESS series were $40,000 and $50,000 in the union sector, then the values of the indices in 1982 are 62.5 for ESS and 70.

[31] This indicates that salaries in most sectors of the economy stagnated during this period.

ported in an American Federation of Teachers (1999a, 1999b) report on salary trends that shows throughout most of the 1980s and early 1990s the rate of increase of teachers' salaries exceeded that of other occupations (Schneider and Nelson 1998). This is prima facie evidence that, all else equal, until very recently (1996–98), when this pattern shifts such that the growth rate of salaries in most other sectors of the economy exceeded that in education, teaching increasingly became a (financially) more attractive field to be in throughout much of the last two decades.

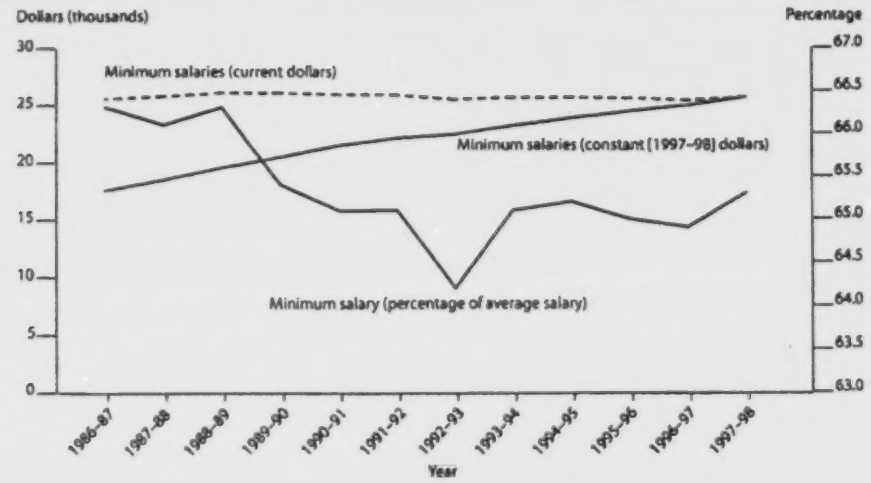
As discussed in the structure of teacher compensation section, most teachers are subject to the uniform salary schedule. This means the aging in the age distribution of teachers can greatly increase the average salary in the profession without making it a more attractive profession to enter. Additionally, there is evidence that teacher salaries schedules were backloaded in the 1980s—that is, the higher steps on the salary schedule were increased faster (and maybe at the expense of) the beginning steps on the schedule (Lankford and Wyckoff 1997). This would further inflate the average salary without necessarily impacting starting salaries. It also means increases in average salary may not serve as a good indicator of how attractive it is to enter teaching. Thus, in the following subsection, how starting salaries in education have changed over time and how they compare relative to starting salaries in other occupations is examined.

## Starting Salaries

Figure 5 shows how the average minimum starting salary in teaching has changed over time and how average minimum starting salaries compare to average salaries. As was the case with average salaries, real starting salaries stagnated for the latter half of the 1980s and throughout the 1990s.

Although there is some evidence of backloading of salaries in the late 1980s and early 1990s when starting salaries declined as a percentage of average salaries, by 1997–98 starting salaries had climbed

Figure 5.—Minimum average starting teachers' salaries




SOURCE: U.S. Department of Education. 1999. *Digest of Education Statistics, 1998.* Washington, DC: National Center for Education Statistics (NCES 1999–036); U.S. Department of Education. 1998a. *Digest of Education Statistics, 1997.* Washington, DC: National Center for Education Statistics (NCES 98–015); American Federation of Teachers. 1999a. *Teacher Salary Boost is One Way to Stem Shortages of Teachers.* Press Release. http://www.aft.org/press/index.html; and American Federation of Teachers. 1999b. *Graveyard: AFT 50-State Teacher Salary Survey.* http://www.aft.org/research/salary/stgrave/begin/92.htm.

back up to almost the same percentage of average starting salaries (65.3 percent) as they were a decade earlier. On the whole, starting salaries in teaching changed little relative to average salaries. Thus, unless starting salaries in other occupations rose markedly relative to salaries in those occupations, starting salaries in teaching likely changed little relative to starting salaries in other sectors of the economy.

Starting salaries in teaching have typically lagged far behind salaries in other occupations and the data presented here do not provide reason to believe this situation has changed (U.S. Department of Education 1993b). For example, figure 6 shows starting salaries in teaching compared to selected other occupations, and figure 7 shows the ratio of starting salaries in those occupations to salaries in teaching (the "salary ratio").

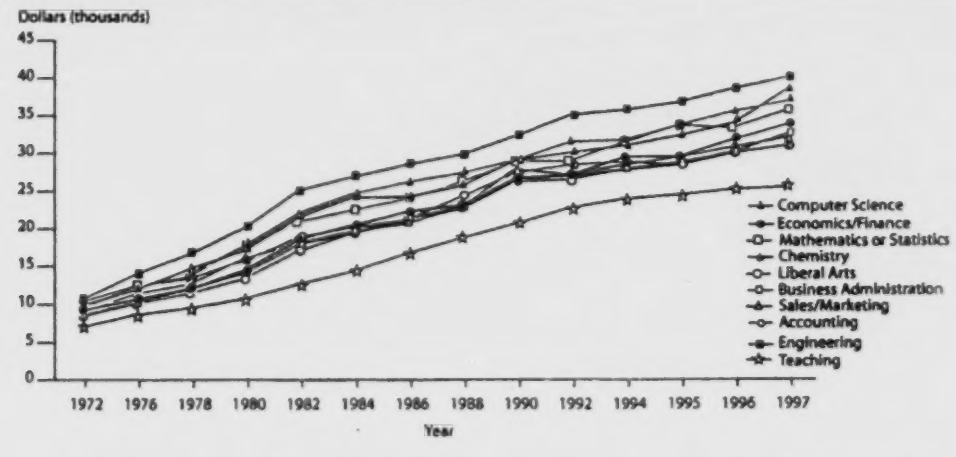
As is apparent from figure 6, teacher salaries were less than any other occupation in every year from 1972 to 1997. Figure 7 clearly shows that during the 1970s and early 1980s starting salaries in teaching fell behind those in other occupations. Much of this loss was recovered by the mid-1990s; however, relative to most occupations, teachers' starting salaries again lost ground after 1995. It is important to note that although much of the lost ground in relative teachers' salaries was made up during the 1980s, in absolute terms starting salaries in teaching were further behind other occupations in the 1990s than in the 1970s. This point is illustrated by figure 8, which shows the differential between real (in 1997 dollars) starting salaries to that of teachers in both 1978 and 1996.

Between 1978 and 1996, the salary ratio decreased substantially for most comparisons, implying that starting salaries in teaching had gained relative to other occupations. However, this can be deceptive. For instance, it is striking that despite decreases in the ratio for chemistry, mathematics or statistics, and computer science, the absolute gap in salaries increased. The magnitude of the gap is also striking, particularly for technical fields. Starting salaries in engineering, chemistry, mathematics or statistics, and computer sciences all exceeded teaching by at least $10,000.

## Implications of Findings

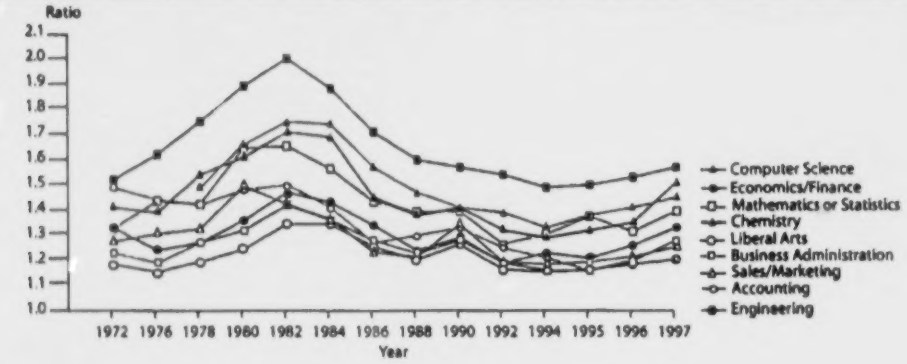
The level and structure of compensation in an occupation plays an important role in attracting or dissuading individuals from entering and exiting that occupation. The

Figure 6.—Starting salaries in select occupations




SOURCE: Schneider, Krista and Nelson, Howard. 1998. *Salary & Analysis of Salary Trends 1997*. AFT Research Report. http://www.aft.org/research/.

Figure 7.—Ratio of starting salaries in select occupations to starting salaries in teaching

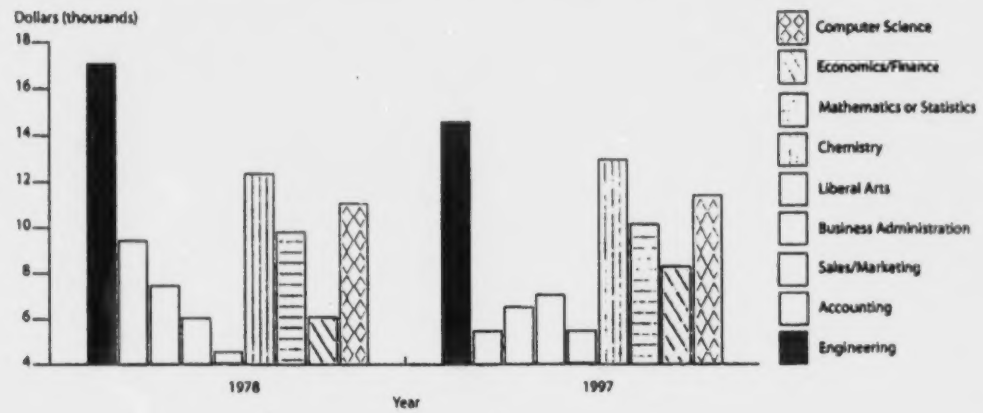



SOURCE: Schneider, Krista and Nelson, Howard. 1998. *Salary & Analysis of Salary Trends 1997.* AFT Research Report. http://www.aft.org/research/.

evidence on changes in teachers' salaries in the third section presents a somewhat mixed picture. Data from various sources shows that real relative starting and average salaries, teaching, over the last 25 years has gone through a cycle, first losing ground relative to other occupations, regaining lost ground during most of the 1980s and early 1990s and again losing ground in the late 1990s.

In some cases increases in relative salaries mask growing gaps between salaries in teaching and those in other occupations.[32] In comparing starting salaries in different occupations, it is clear that, for some white-collar occupations, what a new graduate can expect to make in teaching is substantially less than what that individual would make in other fields.

Figure 8.—Difference between starting salaries in teaching and selected other occupations




SOURCE: Schneider, Krista and Nelson, Howard. 1998. *Salary & Analysis of Salary Trends 1997.* AFT Research Report. http://www.aft.org/research/.

[32] The implications of this are unclear and depend on whether individuals care about relative salary standing or absolute differences in salaries.

This raises an important issue. As discussed, few school systems explicitly provide the flexibility to differentiate pay at the individual level to pay for teacher attributes such as field of specialization, quality of college, grades in college, academic or other awards, or standardized test scores. However, the data clearly shows that different occupations offer different financial rewards, and research has shown that individuals who graduate from more selective colleges have greater labor market opportunities. By contrast, researchers and policymakers tend to refer to teachers and teacher salaries in generic terms. Given the data presented above on college quality and field of specialization, this treatment is inappropriate.

In fact, there is evidence suggesting that the rigid pay structure in teaching may adversely affect the number of high ability individuals entering or remain in the teaching profession (Ballou and Podgursky 1997; Ballou 1996; Ferguson 1998; Hanushek 1986, 1997; Murnane and Olsen 1990). Based on several readily observable measures, teacher candidates and teachers are less skilled than individuals who enter other occupations. As measured by standardized test scores (the SAT, ACT, etc.), most college students selecting education majors tend to be drawn from the lower end of the ability distribution (Hanushek and Pace 1995, U.S. Department of Education 1996a). These findings are summed up in Murnane et al. (1991, 10),

> College graduates with high test scores are less likely to take jobs, employed teachers with high test scores are less likely to stay, and former teachers with high test scores are less likely to return.[33]

On average, the higher the quality of an individual's undergraduate institution, the less likely they are to chose a teaching career (Ballou 1996). In fact, over the last 25 years, there has been a rather dramatic shift away from top tier public and private research universities in the share of MA and Ph.D./Ed.D. degrees in education (Turner 1998). Finally, more education majors than noneducation majors report taking remedial mathematics and English courses (U.S. Department of Education 1996a).[34]

This situation is unlikely to improve unless there is an increase in teachers' compensation. The recent slowdown in growth of both average and starting teachers' salaries combined with a tight labor market imply that teaching will be less financially attractive to many individuals. This is particularly true for individuals with technical skills given there are increasing returns to skills in society.

To make compensation for *all* teachers comparable with compensation in technical fields would require increases in salaries that outpaced the gains at any point in recent history. This leaves school systems with difficult choices and challenges. They could procure and devote unprecedented amounts of money toward teacher compensation, differentiate salaries by teacher skills, and/or risk losing technically proficient individuals to other occupations. This is not a new choice and the existing evidence is that most school systems have opted for the last option.

How school systems respond to these choices will have important, long-lasting effects. Indeed, the National Commission on Teaching and America's Future (NCTAF) has estimated that "more new

...there is evidence suggesting that the rigid pay structure in teaching may adversely affect the number of high ability individuals entering or remain in the teaching profession.

[33] Mean verbal SAT scores for those intending to study education were 409 in 1993–94, compared to 438 for social sciences, 452 for arts and humanities, and 500 for physical sciences (U.S. Department of Education 1998a). Mean GRE scores for those intending graduate study in education were 477 in 1987–88 compared with 529 for social sciences, 541 for business and 685 for engineering. By contrast, teachers tend to have higher college grades, which may simply reflect differences in the grading scales in education courses which tend to be higher than in many other college majors.

[34] Fifteen percent of education majors report taking at least one remedial mathematics course versus 12 percent of noneducation majors. The corresponding figures for remedial English are 13 and 7 percent. These figures raise concern about the quality of the nation's teacher labor force.

teachers will be hired in the next decade than in any previous decade in our history" (NCTAF 1996, 76). These demographics provide policymakers with both a challenge and a golden opportunity to greatly influence the nation's teacher workforce for generations to come.

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## Appendix A: Data

The employment cost index (ECI), which is prepared by the Bureau of Labor Statistics (BLS) Office of Compensation and Working Conditions, measures changes over time in compensation costs which include wages, salaries, and employer costs for employee benefits. The survey covers organizations of all sizes in private industry (except farms and households) and the public sector (except the federal government) throughout the United States. The data reflects average employer costs per hour worked for wages, salaries, and specific benefits for both full- and part-time employees. Measures of wages and salary costs can be obtained separately from overall compensation costs. Additionally, the employee benefits survey (EBS), which is also prepared by BLS, provides annual information on the incidence and supply of selected benefits provided by employers to their employees. Data collected from approximately 6,000 private, state, and local establishments reflects the percentage of employees who participate in certain benefit programs, or as an average of the benefits provided relative to other indicators. Data sources include paid holidays, short-term disability, severance pay, and child-care among many others.[1]

The ECI utilizes a series format and allows series data to be differentiated by four characteristics: component, ownership, group, and seasonality. Where, component indicates the form of compensation (total compensation, wages and salaries, or benefits), group indicates the industry, occupation, region, and/or union status within which the compensation is provided. As such, each series group is classified industry, occupation, region, and/or union. Ownership indicates the employer classification (private, civil, or state and local), and seasonality controls for possible variation due to intra-year variation. The combination of the characteristic listed above (component, group, ownership, and seasonality) produces a nine-character reference code.

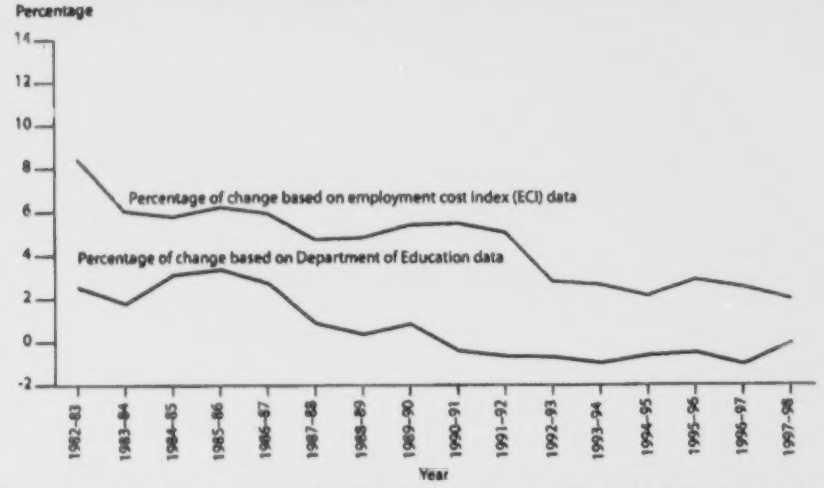
Here, we use three combinations of eight data for both *total compensation* and *wages and salaries* component groups (series data was reported from the second quarter only, and was not adjusted for seasonality). They are as follows:

- All workers—civilian (ECU20001I)
- All workers—private industry (ECU20002I)
- All workers—state and local government (ECU20003I)
- White-collar—private industry (ECU21102I)
- White—collar-state and local government (ECU21103I)
- Service occupations—civil (ECU21301I)
- Service occupations—private industry (ECU21302I)
- Elementary and secondary schools—state and local government (ECU22823I)

[1] Efforts are currently underway to integrate different compensation measures into a single statistical program titled the National Compensation Survey (Bureau of Labor Statistics 1998a).

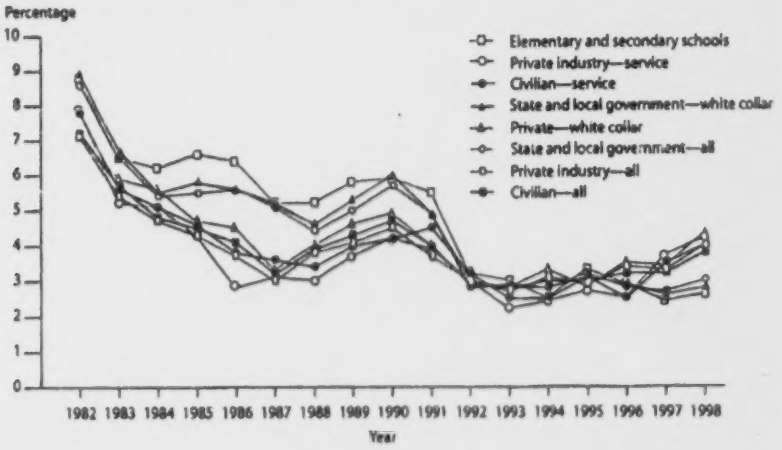
## Appendix B: Additional Graphs

Figure B-1.—Percentage of change in salaries: U.S. Department of Education compared to U.S. Department of Labor, Bureau of Labor Statistics



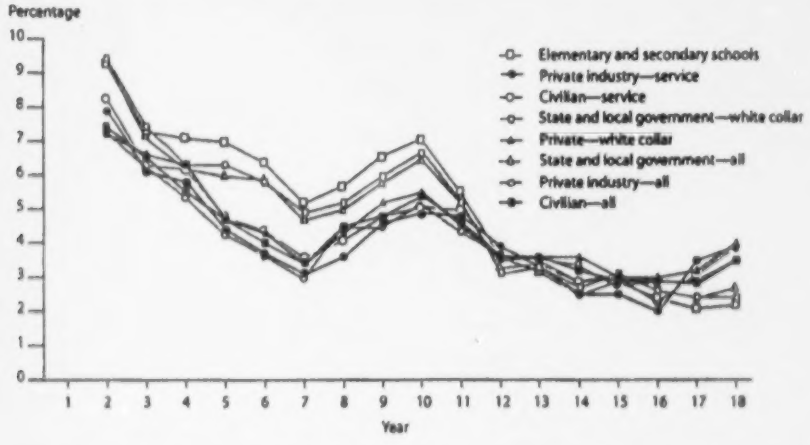

SOURCE: Author's calculations based on data from the U.S. Department of Education. 1999. *Digest of Education Statistics, 1998.* Washington, DC: National Center for Education Statistics (NCES 1999–036); and Bureau of Labor Statistics. 1999. *Employment Cost Trends, 1999.* Washington, DC: U.S. Department of Labor. http://stats.bls.gov/ectserie.htm.

Figure B-2.—Growth rate in wages and salaries: All eight series




SOURCE: Author's calculations basd on data from the Bureau of Labor Statistics. 1999. *Employment Cost Trends, 1999.* Washington, DC: U.S. Department of Labor. http://stats.bls.gov/ectserie.htm.

Figure B-3.—Growth rate in total compensation: All eight series




SOURCE: Author's calculations basd on data from the Bureau of Labor Statistics. 1999. *Employment Cost Trends, 1999.* Washington, DC: U.S. Department of Labor. http://stats.bls.gov/ectserie.htm.

Selected Papers in School Finance, 2000–01

# *A Primer for Making Cost Adjustments in Education: An Overview*

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# A Primer for Making Cost Adjustments in Education: An Overview

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Dr. Fowler has worked for NCES since 1987, before which he served as a supervisor of school finance research for the New Jersey Department of Education. He has taught school finance at Bucknell University and the University of Illinois, and served as a senior research associate for the Central Education Midwestern Regional Educational Laboratory (CEMREL) in Chicago and for the New York Department of Education. He received his doctorate in education from Columbia University in 1977.

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# A Primer for Making Cost Adjustments in Education: An Overview

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## Introduction

Most people intuitively recognize geographic differences in costs and in measuring inflation. The U.S. Bureau of Labor Statistics (BLS) created a "market basket" from expenditure information provided by families and individuals on what they actually bought for the Consumer Price Index (CPI). In 1993, 1994, and 1995, the BLS collected data by using a national sample of over 30,000 families who provided detailed spending habit information. These data enabled BLS to construct the CPI market basket of goods and services and to assign each item in the market basket a weight, or importance, based on total family expenditures. Examples of some of the more than 200 items included in the final CPI market basket appear in table 1 (Williams 1996).

Efforts to compare the costs of exactly the same things in different geographic regions involve comparisons of the same market basket of goods in two geographic areas. The difference in the prices of the same market basket of goods is designed to reveal the differences in the geographic cost of living. But there are immediately detectable difficulties with this market basket. The average market basket may not represent the choices of a person in a particular geographic area and the composition of the market basket changes over time, as does the relative weight of any component.

Where, for example, are personal computers, something many households are currently purchasing, but did not between 1982 and 1984? In addition, corporate downsizing may have caused families to change their spending behavior in 1995 and not engage in as many, or as expensive, apparel and entertainment purchases and restaurant meals as they did between 1982 and 1984. Also, assessing differences in the quality of the items included in the market basket is difficult. For example, a 1984 automobile and a 1999 automobile have substantially different features, even for the same "base" price. How does one adjust the price of the 1984 automobile for air bags or anti-lock brake systems, which did not exist in 1984?

The BLS added an improvement to the CPI in 1987 to recognize quality adjustments of used car prices (Greenlees and Mason

Table 1.—Items included in the CPI market basket

| Item category | Examples |
|---|---|
| Food and beverages | Cookies; cereals; cheese; coffee; chicken; beer and ale |
| Housing | Rent; homeowner's costs; fuel oil; housekeeping supplies; local phone service |
| Apparel | Men's shirts; women's dresses; jewelry |
| Transportation | Airline fares; new and used cars; gasoline; auto insurance |
| Medical care | Prescription drugs; eye care; physicians' services; hospital rooms |
| Entertainment | Newspapers; toys; musical instruments; admissions |
| Other goods and services | Haircuts; college tuition; bank fees |

SOURCE: U.S. Department of Commerce, Bureau of Labor Statistics. December 1996. *Monthly Labor Review*, Appendix 1 "Item structure," 1987 and 1998.

1996). Since January 1999, a geometric mean formula has been used to calculate most basic indexes within the CPI; in other words, the prices within most item categories (e.g., apples) are averaged using a geometric mean formula. This improvement moves the CPI somewhat closer to a cost-of-living measure, as the geometric mean formula allows for a modest amount of consumer substitution as relative prices within item categories change.

When contemplating costs, people wish to:

1. Understand the difference in costs from one geographic area to another (cost of living).

2. Understand how costs have changed over time (inflation).

3. Recognize changes in the quality and quantity of what is being purchased.

To discern these aspects of costs, most people desire an index in which to compare one location or time to another. The CPI uses an index, for example, 112, which is interpreted as meaning that a 12 percent increase in price has taken place between the base time period [index = 100] and the year in which the index is reported as 112. An index of 80 would be interpreted as a 20 percent decrease in prices. Usually, the CPI base is recalculated every decade or so.

In *A Primer for Making Cost Adjustments in Education*, the authors attempt to explain the differences between educational costs and expenditures, explain the differences in the "unit price" of teachers and differences over time in the level of inflation, examine existing indices that can be used to make judgments for these differences in costs, and outline a future plan of action to derive a precise, stable, and accurate index for school administrators and policymakers to use. This overview summarizes that publication and conveys the complexity of what most people intuitively know: there are differences in costs in differing geographic locations and in measuring inflation. These differences are difficult enough to measure in price indices, given item substitution and changes in item quality. However, measuring cost differences in education is even more difficult, since most of the costs are in personnel, rather than in supplies.

## The Difference Between Cost and Expenditure

The cost of education can be defined as the minimum of what must be given up to accomplish some result. "Expenditure" is different from "cost" in that expenditures are not tied to results or outcomes and can exceed the minimum of what must be given up.

Costs can be organized according to an allocation hierarchy where the lowest level

is the unit cost of various inputs like teachers' time, space, and supplies. At the next level, there are costs that occur as the individual inputs are combined to form educational services within classrooms and schools. Finally, at the uppermost level are the actual outcomes of schooling where costs arise because of the differentiation and special needs of the students being educated. Resource allocation decisions are made at each of these levels, and it is useful to keep them distinct because this can allow us to determine the relative magnitude of each source of cost.

## Cost

### Cost Adjustments in Education

Currently, per pupil expenditures or teacher salaries are commonly reported as nominal state or school district averages, without correction for differences in the geographic cost of living (U.S. Department of Education 1999). There is good empirical evidence that geographic cost differentials exist, however. For example, Barro (1994) states:

> The fact that Florida spends 36 percent more than Arkansas to provide virtually the same staff-to-pupil ratio is largely explained by Florida's 28 percent higher instructional staff salaries (p. 7).

Most of the costs of providing public education are personnel costs, such as providing employees' salaries and fringe benefits.[1] Salaries average about 65 percent of total current expenditures and employee benefits about another 16 percent, so that these two categories alone are responsible for over 80 percent of a school district's expenditures (Fowler 1993). Purchased professional services, which in part acquire the services of professionals,[2] accounts for more personnel expenditures, as does purchased property services[3] student transportation. Supplies are truly minor in such an enterprise. While some may wish to debate the attributes of one brand of personal computer diskettes over another, most persons will generally concede that they are interchangeable.

The personnel that staff school districts, however, are certainly not interchangeable, and have vastly different attributes, even if one compares them on such uniform characteristics as educational attainment and occupational experience. These differences make comparing geographic differences in the price of personnel difficult, as one might mistakenly measure differences in the jobs they perform or in their personal characteristics, such as the nature of the undergraduate institution they attended. Imagine, for a moment, that one school district is located in a suburban college town, while another is located in a rural area. Both spend the same per pupil, but the school district with the college offers post retirement positions to college faculty to teach secondary courses and to work in administrative and support services. Assuming such retired staffs are still capable, the staffs are of vastly different quality, despite comparable degree status, teaching experience, and expenditures.

...quality differences in education make geographic cost differences difficult to measure.

These quality differences in education make geographic cost differences difficult to measure. School districts can choose to employ better-educated, more experienced staff, or to reduce class size, or to hire more specialized staff, all of which are more expensive staff choices. They may wish to maintain small school systems, which may be more expensive to operate, or they may choose to hire expensive administrators. In short, while school districts must adhere to numerous rules and regulations from federal as well as state sources, they retain

[1] Benefits may include retirement, Social Security contributions, medical and group life insurance, unemployment, tuition reimbursement, workman's compensation, accrued sick leave, and professional dues and fees.

[2] Examples include architects, engineers, auditors, dentists, medical doctors, lawyers, consultants, computer programmers, psychologists, social workers, and accountants.

[3] Examples include utility and cleaning services, snow plowing, custodial services, lawn care, and repair and maintenance.

a significant amount of discretion over spending, particularly spending that goes beyond what mandates require. Just as school districts choose to trade cost and class size, people trade salary and benefits for amenities. As Chambers and Fowler put it,

> The intuitive notion underlying [the hedonic wage model] is that individuals care both about the quality of their work environment as well as the monetary rewards associated with particular employment alternatives, and that they will seek to attain the greatest possible personal satisfaction by selecting a job with the appropriate combination of monetary and nonmonetary rewards. (Chambers and Fowler 1995, xv).

The purpose of a geographically based teacher price index is to determine the relative cost of engaging the services of comparable teachers.

A cost-of-education index, therefore, must simultaneously take into account those discretionary factors that a school district might manipulate, such as quality and quantity of staff, and those nondiscretionary factors that the school district cannot control, such as the cost of living, the competitiveness of the labor market, and amenities, such as climate, absence of crime, and geographic location (such as proximity to water). The resulting index might be used to determine the cost to school districts, in different geographic locations, to acquire and retain similar qualities and quantities of staff. However, such an index does not describe what the CPI does, that is, it does not measure the change over time in the prices paid by school districts.

## Geographically Based Cost Adjustments

The purpose of a geographically based teacher price index is to determine the relative cost of engaging the services of comparable teachers. Some of the necessary components include: teacher characteristics (level of experience, training, minority status, gender), cost-of-living adjustments, regional amenities, employment amenities, nonteaching wages and employment opportunities in the region, union and collective bargaining, and demand for teacher quality. Several scholars have attempted to define a geographically based index. The Teacher Attribute Model is the result of Stephen Barro's (1994) approach. Barro did not strive to include all of the components outlined above in order to keep the number of assumptions based on incomplete data low. His estimate focuses on interstate comparisons and estimates what each state's average teacher's salary would be if the state employed teachers with the same average experience and training as that found in the nation as a whole.

McMahon and Chang (1996) characterized the "market-basket" approach. This approach does not focus on school personnel but rather on costs that are outside of the school's control such as wages in other sectors of the economy and geographically based differences in the cost of living. One reason for this focus is to prevent a feedback loop rewarding schools that increased salaries. The basic factors in this model are the value of housing, per capita income, the percent change in population for the preceding decade and variables representing regions of the country. It can predict cost-of-living indices at several levels of aggregation.

The "hedonic" model (Chambers 1998) is a more ambitious approach that deals explicitly with each of the influences listed above. The model is called hedonic because it is sensitive to whatever it is that teachers find attractive or repelling about a given career opportunity. The Teacher Cost Index (Chambers and Fowler 1995) is an example of this approach. Using Schools and Staffing Survey (SASS) data, it includes teacher characteristics (ethnicity, gender, education, and experience), working conditions (class size), and salary information. Other data sources were used to assess the regional amenities. Cost influences that the school has control over were statistically controlled while other influences were allowed to vary.

The Geographic Cost-of-Education index (Chambers 1998) is a more recent application of this approach. In this model the index was broadened to include other types of inputs (school administrators, noncertified school personnel, nonpersonnel) and widened the range of data sources. Both approaches run the risk of relying too much on potentially questionable data sources and assumptions.

The production function models are perhaps the most ambitious by focusing on the costs associated with actually realizing gains in educational performance. Unfortunately there is a lack of adequate data and complete theoretical specification for this model to have widespread use in practice. However, in recent years this model has been applied to several states. For an example, see the application to New York (Duncombe, Ruggiero, and Yinger 1996). There also have been applications to Wisconsin and Texas.

A comparison of the three main models (Barro, McMahon, and Chang; and Chambers and Fowler) demonstrates that the indices are highly correlated at over .70. Also, the more adjustments are made, the more the degree of variation drops. Despite the high correspondence between these indices, there are certain regions where there is disagreement between the indices. A comparison between the hedonic model and the cost-of-living model may indicate that this discrepancy is due to the region's attractiveness (such as San Francisco) or unattractiveness (such as nonmetropolitan Connecticut) to most teachers.

## Cost Adjustments Over Time

Adjusting for regional cost-of-living differences is only one of the challenges to producing a cost-of-education index. The other major challenge involves adjusting for cost-of-living differences over time. Different deflators can lead researchers to different conclusions.

The most common way of measuring inflation is the method used by the Consumer Price Index (CPI) where the cost of commonly purchased items is tracked over time. The School Price Index is one example of this method that uses the urban component of the CPI, the CPI-U. Unfortunately, this index can only be used at the national level. There are many problems with applying the CPI approach to education, especially the change of relevant products over time (item substitution) and the uneven growth of inflation for different occupational areas. Education is one of those occupations that have been strongly influenced by changes in technology. This makes it difficult to track inflation since the supplies bought today (such as the computer or VCR) are not really comparable to the supplies of a few decades ago (such as the typewriter or projector). The second problem is that some areas have seen strong inflation (such as medicine) while other areas have not. Rothstein and Mishel (1997) argue that due to factors such the increase in quality due to smaller teacher/student ratios have made inflation greater for education. Their solution is to use the Net Services Index (NSI), which measures inflation by focusing on labor-intensive components of the CPI similar to education. However, they acknowledge that while the NSI is an improvement, it is still an underestimate.

Adjusting for regional cost-of-living differences is only one of the challenges to producing a cost-of-education index.

A second approach, the Inflationary Cost-of-Education Index (ICEI) modifies the hedonic TCI to include school administrators and noncertified staff. However, given data limitations this only provides a 6-year inflation index during the years SASS was administered.

The Employment Cost Index (ECI) also avoids the market-basket approach by measuring the rate of change in employee compensation, which includes wages, salaries and employer's costs for employee's benefits. It covers all occupations with the exception of federal government workers, and is used extensively by the Federal Reserve Board as a measure of inflation. It has an education subscale and has separate data on salaries as well as fringe benefits. Of all of the indices, this one is the most attrac-

tive because it avoids the pitfalls of item substitution found in the market-basket approach and has a large time frame (1981 to 1996) available.

### Using Geographic and Inflation Deflators

Both geographic and inflation cost adjustments suffer from many flaws. Overall there is correspondence between different geographic indices, however for a particular area the results can be dramatically different. Given the political nature of these adjustments, such discrepancies can be as problematic as they are informative. While the addition of more adjustments leads to a reduction of variability and arguably greater accuracy, the policymakers' reluctance to use adjustments is understandable.

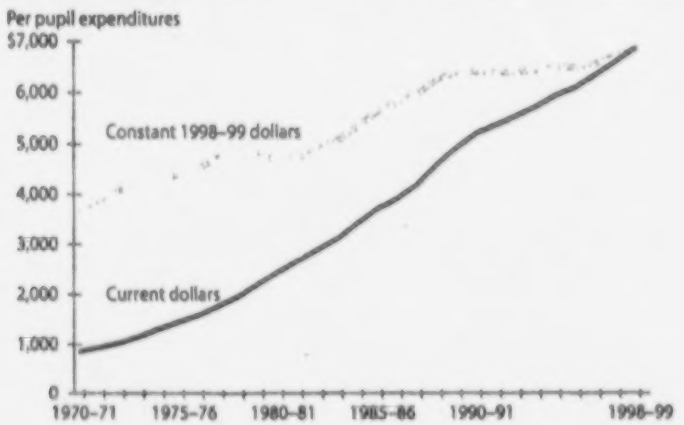
## Expenditure

### Education Expenditures Over Time

Per pupil expenditures from 1970 to the present are sometimes reported in both current and "constant" dollars (figure 1). Inflation has been removed from these expenditures by using the CPI. Thus, the reported 1970–71 per pupil expenditure of $3,774 is reported in constant 1998–99 dollars as $6,915. Unfortunately, the CPI is not specifically designed to measure changes in education costs between time periods, that is, the market basket does not include public education costs (or taxes) (although it does include private school tuition). In addition, some argue that the CPI consistently overestimates inflation, which will make the 1970–71 per pupil expenditure higher than it should be; it makes us think that the investment in education has been greater than, in fact, it was (U.S. Senate 1996 [better known as the Boskin Commission]).

What would be ideal when wishing to report education expenditures over time would be a cost-of-education index that was computed each year (or every several years), that both held constant the average school district discretionary costs, while measuring those costs that a school district cannot influence, including geographic amenities. Such an "education inflation index" would more accurately portray increases in education spending.

Figure 1.—Current per pupil expenditure in average daily attendance in public elementary and secondary schools: 1998–99




SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems, Revenues and Expenditures for Public Elementary and Secondary Education*; and Common Core of Data surveys, unpublished tabulations.

## Lessons to Learn and Directions for Future Work

There are two primary goals for the future of geographic cost adjustments: improve the index of cost variations as well as educate the public and policymakers about any progress that is made. The basic challenges are: make the indices generalizable across different levels (local, state, and region), separate and distinguish influences that are controllable by the school, be careful of double counting when adding new adjustments, and address any political considerations.

Advice for next steps:

1. Keep the indices as simple and understandable as possible.

2. Strive to reach consensus about how ambitious you wish to be with respect to cost adjustments in full knowledge of the flaws that remain in the available tools.

3. Keep in mind that not all adjustments are beneficial to all parties. Be particularly wary of flawed adjustments that benefit one set of political interests over others.

4. Provide for gradual phase-ins. Consider "quasi-leveling up" strategies and take advantage of inflation.

5. Place primary emphasis on supporting the further improvement of the available indices.

A more sophisticated index will allow policymakers to more accurately identify what costs are the results of regional differences and what changes in costs over time are the result of different decisions and factors. This will allow a more efficient allocation of educational resources. Both the public and policymakers need to be informed of progress made in this area so the index can be better utilized and a consensus can be reached on the appropriate approach.

## Conclusions

Our first conclusion is that the education research community has not paid sufficient attention to both geographic and inflationary differences in the costs of education. In most cases, geographic cost adjustments have not been applied when assessing, for example, intra-state fiscal equity. The courts, plaintiffs, and defendants have tended to use nominal per pupil current expenditures in their arguments. However, there is ample evidence that geographic cost differences are something those contemplating per-pupil expenditure equity should remove from their considerations. Generally, the use of geographic cost adjustments reduces most measures of disparity. Although the equity measures show less disparity after cost-adjustment than before, substantial variations remain. However, for those school districts that are acquiring higher-quality staff, or greater numbers of staff (reducing pupil/teacher ratios), the correction of their nominal expenditures will cause their expenditures to be even greater than before. The most common use of geographic cost adjustments has been to give school districts in high cost-of-living areas higher state aid. However, this common usage should be reconsidered, since such aid may be disequalizing, that is, it may aid wealthy school districts to the detriment of the poor. In addition, it is not, we would argue, the cost of living for which we wish to compensate these school districts. Rather, we would wish school districts be compensated for the acquisition and retention of comparable staff, wherever they reside. This is why we feel more conceptually comfortable with the hedonic rather than the market basket approach. Some school districts in tony locations with a cachet and superb facilities and a student body with panache may acquire and retain very talented teachers for much less than their less fortunate neighbors, who can only attract such a staff by paying a large premium. To date, educational researchers have not emphasized these differences, in part because a suitable methodology for estimating these effects has been unavail-

The most common use of geographic cost adjustments has been to give school districts in high cost-of-living areas higher state aid.

able. The good news is that indices of this kind are becoming available. The not so good news is that the available indices remain flawed because they fail to distinguish perfectly between expenditures and bona fide costs and may introduce perverse incentive effects that could increase spending on education with little resulting gain.

Our second conclusion is that existing cost adjustments are frail reeds, indeed. Despite his precision and intricate methodologies, Chambers arrives at very different geographic cost adjustments for 1990–91 and 1993–94 for Chicago, Philadelphia, and Detroit. These differences are pale in comparison to differences between researchers and methodologies. What would be desirable would be an emerging consensus about the appropriateness of a given technique, and general unanimity regarding its application, at least in adjusting nominal (actual) revenues or expenditures. Instead, we see researchers still vociferously debating the merits of their own work, and the defects of the approaches of their similarly situated brethren. Until the academic community agrees in the robustness of any cost adjustment, the future use of any adjustment seems unsustainable. If the cost adjustments are not viewed as hardy, commonplace and utilitarian tools, then there will no longer continue to be an investment on the part of the research community to attain them.

We were also unprepared for the sobering discovery that these worthwhile and desirable adjustments would provoke such rancor. The simple use of one geographic cost adjustment versus another was sufficient for one researcher to suggest that state-aid systems that employ such an adjustment "...encourages inefficiency and invites disaster (McMahon 1996, 95)." Another highly regarded economist interprets an analysis of measurement issues by Mishel and Rothstein on how to include the effects of inflation in measuring school spending as providing perhaps the most persuasive case for a productivity collapse [in education] (Hanushek 1997, 185). We encourage all parties to engage in spirited debates that are grounded in the facts at hand.

Our third and final conclusion is that more effort needs to be devoted toward building consensus in the methodologies that can be used as geographic cost adjustments and as deflators. There is a great need in the education finance research community for these mechanisms in order to better understand education spending in real terms. We even would go so far as to suggest that it is improper to analyze education spending without correction for differences in geographic costs, or differences in costs over time without correction for the effects of inflation. However, we also find it improper to analyze "adjusted" figures where details surrounding the nature of the adjustments are inaccessible to the consumer. Situations like these cry out for the use of sensitivity analyses so that analysts, policy makers, consumers, and taxpayers alike can have an understanding of how sensitive the results of the analyses are to the use of one rather than another of the possible cost adjustment techniques.

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# *Assessing the Financial Condition of Public School Districts: Some Tools of the Trade*

# Assessing the Financial Condition of Public School Districts: Some Tools of the Trade

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# Assessing the Financial Condition of Public School Districts: Some Tools of the Trade

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## Introduction

The term "financial condition" means different things to different people. Some consider it to be a school district's financial standing at a given point in time. Some think of it as a district's ability to make ends meet. Others look at it as a district's capacity to raise revenue. The definition of financial condition employed in this paper is broader, encompassing aspects of each of those definitions:

> Financial condition is the ability of a school district to meet its obligations as they come due and to finance the services its constituency requires.

Understood in these terms, financial condition is a comprehensive barometer of a school district's overall fiscal health. As such, it is determined by a myriad of factors, including the health of the local economy, the disposition of the political environment, and the prevailing wishes of the citizenry. The principal information about a school district's financial condition is clearly financial in nature and is derived from a variety of sources, including budget documents, bond prospectuses, and financial statements. This paper provides an overview of the financial information to consider when attempting to determine a school district's financial condition, particularly that information contained in a district's annual financial statements.

This paper also pays particular attention to the financial statement information school districts will provide when they have implemented Governmental Accounting Standards Board (GASB) Statement 34.[1] Statement 34, issued in June 1999, dramatically revised the format school districts follow when preparing financial statements according to generally accepted accounting principles (GAAP). Among the major features of the new financial statements that school districts will be preparing are:

[1] Governmental Accounting Standards Board. 1999. *Statement No. 34: Basic Financial Statements—and Management's Discussion and Analysis—for State and Local Governments.* Norwalk, CT: GASB.



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- Two new financial statements, covering all of a district's activities and prepared using full accrual accounting (see tables 1 and 2)
- More detailed information in the fund financial statements (see tables 5 and 6)
- A narrative management's discussion and analysis (MD&A), prepared by a district's finance officers, that offers a summary analysis of the financial statements.

The body of this paper is presented in eight sections. The first section of this paper summarizes some important considerations regarding the practice of financial condition assessment and describes what categories of information should be considered and why. Then, each of the next six sections discusses one of those categories of financial condition information: common-size ratios; financial position and changes in financial position; liquidity and solvency; fiscal capacity; risk and exposure; and other factors. The final section offers some thoughts regarding other sources of financial data and their comparative advantages and disadvantages relative to financial statement information.

Financial condition analysis varies in form and function because the needs and interests of analysts vary considerably.

## Overview of Finanical Condition Analysis

Financial condition analysis is not a regimented, strictly-defined science. There are at least two reasons why it may be considered more of an individualistic art form. First, people measure financial condition in many different ways. Second, financial condition ultimately boils down to a subjective decision by the analyst, so that two people looking at the same financial information can come to different conclusions about a school district's condition. These should not be construed as *weaknesses* in financial condition analysis. Financial condition analysis varies in form and function because the needs and interests of analysts vary considerably.

If not a weakness, though, this inherent flexibility can be a *threat* to the credibility and reliability of the conclusions that an analyst draws from his analysis. It is much easier to defend your conclusions about a district's financial condition if your analysis is methodologically unassailable. Protecting and enhancing the credibility of your financial condition analysis can be accomplished by following two rules.

First, financial information does not exist in a vacuum. Because there are few or no absolutes when assessing school district finances, some kind of context is needed in order to make the information meaningful. In other words, compare the information to a benchmark in order to know whether the information is telling good or bad things about a school district. Such comparisons typically are made with other, similar school districts, or with a district's information for prior years. This comparison can tell if financial condition is improving or diminishing, or if a district's condition compares favorably or unfavorably with other districts. For these reasons, the first tools considered in this paper are *common-size ratios*, which can provide a context for understanding financial statement information and offer a common metric for comparisons.

Second, thoroughness is next to godliness. The fewer stones left unturned, the better the analysis potentially may be. As we shall see, one or two or even several financial ratios cannot provide a complete picture of a school district's finances. A single financial factor may suggest one thing about a school district, but when considered alongside other information may suggest a different conclusion. Financial condition analysis is an iterative process, like peeling away the layers of an onion. Calculating financial ratios will raise questions and



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identify potential issues, leading to further and more in-depth examination of a district's finances. The effort to answer these questions may raise further questions still. So, how thorough is thorough enough? Ultimately, a decision will need to be made about how far to pursue the questioning, by weighing the potential benefits of additional analysis against the effort they require, and based on a personal comfort level that the analysis has reasonably considered all relevant factors.

The definition of financial condition used in this paper suggests that two time dimensions must be considered—the present and the future. On the one hand, we want to know where a district stands financially right now—what kinds of debts and obligations does it face, what kinds of resources does it have available to repay them, and what resources will be left over? On the other hand, we need insight regarding the district's wherewithal to continue providing services in the future—will it obtain sufficient resources in the near and long term to cover its costs? Can it afford to issue debt or raise taxes? What potential risks are looming just beyond the horizon?

Understanding a district's current financial standing—its *financial position*—necessitates a comparison of the asset and liability information in its statement of net assets or balance sheet. Because it is important to place information in a comparative context, we are also interested in information in a district's income statement that describes *changes in financial position.*

Once we have established where a district stands now, we must look to information that describes where it is going. *Liquidity ratios* can inform us about whether a district will be able to pay its bills in the short run, and whether it will bring in sufficient resources to cover the recurring, annual costs of operating a school system. A district's ability to meet its long-term obligations—to repay bonds, or to cover future costs like compensated absences and leave pay—can be assessed with the use of *solvency ratios.*

Because the future is fraught with uncertainty, it is crucial to understand whether a district has the capacity or flexibility to respond to the needs of those it serves. This paper applies the general rubric of *fiscal capacity* to the set of financial ratios that speak to these concerns. Can the district raise taxes if costs rise? Can it issue bonds to finance capital needs? Can it afford even its current levels of taxes and debt? The succeeding section of the paper presents additional ratios that can help ferret out the potential financial *risks* a district may face, as well as its *exposure* to potential financial problems.

Although this paper predominantly considers financial condition information that derives from annual financial statements, *other factors*—most notably socioeconomic and demographic data, and performance measures—are equally crucial to developing a focused picture of school district financial health. The penultimate section of this paper describes some of those factors in general.

## Categories of Financial Condition Ratios

### Common-size Ratios

The most basic financial analysis tools are *percentage change* and *percentage distribution,* collectively referred to as *common-size ratios* because they put financial information in a form that allows meaningful comparisons among districts of varying sizes. Did outstanding debts grow or shrink? Was state aid a larger or smaller share of revenue? In most cases, common-size ratios should be the first analyses you perform, because they can provide a quick overview of the finances of a district and how they have changed.

In most cases, common-size ratios should be the first analyses you perform, because they can provide a quick overview of the finances of a district and how they have changed.



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Percentage distribution indicates the portion of a total category represented by individual elements within the category—for example, the percentage of total expenses accounted for by various school district activities, such as regular education, special education, counseling, and administration. Percentage distribution (see ratio 1 below) is calculated using unrestricted net assets from the district-wide statement of net assets (table 1) as an example.

Percentage change is the *magnitude* of change from year to year, which is more meaningful for comparisons with other districts than aggregate dollar changes. It is calculated (ratio 2) using food services expenses

Table 1.—District-wide statement of net assets

Example Independent School District
Statement of Net Assets
As of June 30, 2002

| | Governmental activities | Business-type activities | Total |
|---|---|---|---|
| ASSETS | | | |
| Cash and cash equivalents | $ 106,268,980 | $ 7,828,243 | *$ 114,097,223* |
| Property taxes receivable (net) | 12,182,730 | | *12,182,730* |
| Due from other governments | 19,968,336 | 2,002,921 | *21,971,257* |
| Other receivables | 2,252,919 | 4,081 | *2,257,000* |
| Internal balances | 615,597 | (615,597) | |
| Inventories and prepaid expenses | 1,537,230 | 1,949,526 | *3,486,756* |
| Nondepreciated capital assets | 32,272,411 | | 32,272,411 |
| Depreciated capital assets | 381,428,545 | 11,549,456 | 392,978,001 |
| Less: Accumulated depreciation | (98,176,725) | (9,016,026) | (107,192,751) |
| Total assets | 458,350,023 | 13,702,604 | *472,052,627* |
| LIABILITIES | | | |
| Accounts payable and other current liabilities | 33,305,354 | 580,730 | *33,886,084* |
| Deferred revenues | 3,117,910 | 723,038 | *3,840,948* |
| Long-term obligations | | | |
| Due within one year | 21,569,854 | | *21,569,854* |
| Due beyond one year | 108,793,747 | | 108,793,747 |
| Total liabilities | 166,786,865 | 1,303,768 | *168,090,633* |
| NET ASSETS | | | |
| Invested in capital assets, net of related debt | 231,118,669 | 2,533,430 | 233,652,099 |
| Restricted for: | | | |
| Debt service | 4,133,180 | | 4,133,180 |
| School-based activities | 1,396,569 | | 1,396,569 |
| Unrestricted | 54,914,740 | 9,865,406 | *64,780,146* |
| Total net assets | $ 291,563,158 | $ 12,398,836 | *$ 303,961,994* |

NOTE: Italicized numbers are those used in the ratios.

SOURCE: Adapted from Mead, Dean Michael. 2000. *What You Should Know about Your School District's Finances: A Guide to Financial Statements.* Norwalk, CT: Governmental Accounting Standards Board.

Ratio 1.—Percentage distribution

(individual element amount ÷ total category amount) x 100 =
(unrestricted net assets ÷ total net assets) x 100 =

(64,780,146 ÷ 303,961,994) x 100 = 21.3 percent

Ratio 2.—Percentage change

[(current year amount – earlier year amount) ÷ earlier year amount] x 100 =

[(20,596,032 – 18,965,236) ÷ 18,965,236] x 100 = 8.6 percent increase



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from the district-wide statement of activities (table 2) as an example.[2]

## Financial Position

Financial position essentially is a district's financial standing at a given time, based on a comparison of the resources it generally owns or controls with the obligations it faces. One of the benefits of Statement 34 is that it requires school districts to prepare two district-wide financial statements using accrual accounting—the statement of net assets (table 1) and the statement of activities (table 2). These statements are the first available presentation of *all* of a school district's assets and liabilities and all of its revenues, expenses, and other changes in net assets together in one place. It is the most comprehensive accounting of financial position ever available.

The most straightforward indicator of financial position is "assets minus liabilities" or *net assets*. Table 2 shows that total net assets for a fictional "Example" independent school district (ISD) increased $20,341,902 in fiscal year 2002. All things being equal, an increase in net assets is an improvement in financial position. Likewise, a decrease in net assets is a decline in financial position.

In order to obtain a sense of the *magnitude* of the change in financial position, some analysts compare the aggregate net assets amount to the district's overall level of financial activity, using either revenues or expenses. It is calculated in ratio 3 for Example ISD using information in tables 1 and 2.

This ratio can be examined over time and compared to other similar entities after it has been placed in context. This is necessary because comparing aggregate net assets or change in net assets amounts is misleading if a district's level of financial activity changes over time or if districts of various sizes are compared. If two districts—one with annual expenses of $20 million and the other $80 million—each had a $1 million increase in net assets, the increase is obviously much more significant for the district with the lower annual expenses.

In order to facilitate comparisons, consider building a comparison group. A comparison group may consist of nearby school districts, or all districts of a similar size in the same state, or similar districts in neighboring states, or some other meaningful assemblage. Using information from those districts' financial statements, calculate average or median financial ratios, against which the district of interest may be compared. Table 3 shows the net assets divided by expenses ratio for 10 fictional districts in the same state as Example ISD and calculates a relative index by dividing Example's ratio by the 10-district average.[3] Example's ratio of net assets to expenses is higher than eight of the 10 districts' ratios, and about 14 percent higher than the average for the comparison group. (See the final section of this paper for further discussion of comparative financial information.)

Such comparisons become even more meaningful when they are tracked over time. Table 4 presents the trend in the relative index for the last 5 years, revealing that Example's ratio has been improving relative to the other districts.

The statement of net assets divides net assets into three categories—the portion that is related to capital assets, the portion that is restricted to specific uses, and

Financial position essentially is a district's financial standing at a given time, based on a comparison of the resources it generally owns or controls with the obligations it faces.

Ratio 3.—Financial position

net assets ÷ total expenses = 303,961,994 ÷ 410,123,330 = 0.741

[2] Comparisons of current and prior year financial information can be found in a district's MD&A.

[3] Note that the average is *not* calculated by adding the ratios together and dividing by 10, but by dividing the sum of all 10 districts' net assets by the sum of all 10 districts' expenses.

Table 2.—District-wide statement of activities

Example Independent School District
Statement of Activities
For the Year Ended June 30, 2002

| Functions/Programs | Expenses | Program revenues: Charges for services | Program revenues: Operating grants and contributions | Program revenues: Capital grants and contributions | Net (expense) revenue |
|---|---|---|---|---|---|
| Governmental activities | | | | | |
| Instruction and instruction-related services | $ 234,774,862 | $ 5,509,719 | $ 27,631,301 | | $ (201,633,842) |
| Instructional and school leadership | 33,579,907 | | 3,783,490 | | (29,796,417) |
| Support services—student-based | 37,311,861 | 2,986,172 | 4,203,974 | | (30,121,715) |
| Administrative support services | 9,365,149 | | 1,055,183 | | (8,309,966) |
| Support services—nonstudent-based | 57,379,902 | | 5,465,065 | | (51,914,837) |
| Community services | 2,753,346 | | 131,297 | | (2,622,049) |
| Interest on long-term debt | *5,969,465* | | | | (5,969,465) |
| Depreciation—unallocated* | *6,555,053* | | | | (6,555,053) |
| Total governmental activities | 387,689,545 | 8,495,891 | 42,270,310 | | (336,923,344) |
| Business-type activities | | | | | |
| Food services | *20,596,032* | 4,750,350 | 15,849,235 | $ 750,000 | 753,553 |
| Adult education | 1,837,753 | 936,150 | 1,102,491 | | 200,888 |
| Total business-type activities | 22,433,785 | 5,686,500 | 16,951,726 | 750,000 | 954,441 |
| Total school district | *$ 410,123,330* | $ 14,182,391 | *$ 59,222,036* | *$ 750,000* | $ (335,968,903) |

| | Governmental activities | Business-type activities | Total district |
|---|---|---|---|
| Changes in net assets | | | |
| Net (expense) revenue (from above) | $(336,923,344) | $ 954,441 | $ (335,968,903) |
| General revenues | | | |
| Taxes | | | |
| Property taxes, levied for general purposes | 154,108,322 | | *154,108,322* |
| Property taxes, levied for debt service | 16,860,557 | | *16,860,557* |
| State aid—formula grants | 176,265,211 | | *176,265,211* |
| Investment earnings | 7,397,103 | 312,271 | *7,709,374* |
| *Special item*—gain on sale of unimproved land | 1,367,341 | | 1,367,341 |
| Total general revenues and special item | 355,998,534 | 312,271 | 356,310,805 |
| Change in net assets | 19,075,190 | 1,266,712 | *20,341,902* |
| Net assets—beginning | 272,487,968 | 11,132,124 | 283,620,092 |
| Net assets—ending | $ 291,563,158 | $ 12,398,836 | $ 303,961,994 |

*This amount excludes the depreciation that is included in the direct expenses of the various programs.

NOTE: Italicized numbers are those used in the ratios.

SOURCE: Adapted from Mead, Dean Michael. 2000. *What You Should Know about Your School District's Finances: A Guide to Financial Statements.* Norwalk, CT: Governmental Accounting Standards Board.

the portion that is unrestricted. This allows more specific assessments of financial position, if preferred. The change in just unrestricted net assets, rather than total net assets can be tracked using multiple years' financial statements. The net assets of just the governmental activities—the typical, bread-and-butter activities of school districts, like pupil education and transportation—may also be examined if the resources of the business-type activities cannot be used to finance the district's other activities.

Table 3.—Net assets-to-expenses ratio for "Example" independent school district's (ISD) comparison group, fiscal year 2002

| | |
|---|---|
| Sample ISD | 0.619 |
| Standard ISD | 0.514 |
| General ISD | 0.489 |
| Regular ISD | 0.567 |
| Illustrative ISD | 0.687 |
| Comparison ISD | 0.641 |
| Average ISD | 0.682 |
| Typical ISD | 0.801 |
| Common ISD | 0.776 |
| Usual ISD | 0.595 |
| 10-district average | 0.651 |
| Example ISD | 0.741 |
| Index (example ÷ average) | 1.138 |

SOURCE: Author's sketch.

Table 4.—Index comparison of "Example" independent school district's (ISD) net assets-to-expenses ratio with the 10-district average, fiscal years 1998–2002

| | |
|---|---|
| Fiscal year 1998 | 0.997 |
| Fiscal year 1999 | 1.060 |
| Fiscal year 2000 | 1.112 |
| Fiscal year 2001 | 1.129 |
| Fiscal year 2002 | 1.138 |

SOURCE: Author's sketch.

Change in financial position for a given year can also be placed in context by comparing it to financial activity (ratio 4).

Care should be shown in the interpretation of any financial ratio, because there are almost always "extenuating circumstances." In other words, instead of taking a ratio at face value, an understanding of the circumstances in which the ratio was produced should be sought. For example, it is not sufficient to compare two governments and conclude that the one with the higher change in net assets as a percentage of expenses was financially healthier in a given year. Such a conclusion should be based on a wider array of relevant information than just this one ratio.

Furthermore, an understanding of *why* net assets changed is needed. Growth in net assets might be the result of a healthy economy that generated revenues in excess of expenses. On the other hand, a district might have ended the year with more revenues than expenses because it failed to provide needed services. Clearly, judgments about financial condition would differ in these two cases.

Depending on the aim of your analysis, you may want to limit it to common, recurring revenues and expenses, thereby insulating it from the distortion of financial impacts related to unusual events or circumstances. Statement 34 requires that school districts report *special items* and *extraordinary items*, transfers, and certain other changes in net assets separately from more typical revenues and expenses (or expenditures, in the case of the governmental funds statements).[4] Tables 2 and 6 reveal that Example ISD sold a parcel of land during the year.[5] Because this is not likely to be a common activity of a school district, you might want to exclude

Ratio 4.—Change in financial position

change in net assets ÷ total expenses = 20,341,902 ÷ 410,123,330 = 0.0496

[4] Statement 34 defines extraordinary items as both unusual in nature and infrequent in occurrence, while special items are either unusual or infrequent (but not both). Further, special items are within the control of the district.

[5] Table 6 is prepared using modified accrual accounting and therefore shows the total proceeds from the land sale. Table 2, however, uses accrual accounting, and therefore shows only the *gain* (or loss) on the sale—proceeds minus original cost.

it from your analysis. Similarly, if a tornado were to strike the New England region (an extremely rare occurrence), the ensuing repairs and cleanup could be considered uncommon costs that you might want to exclude. Additional ratios to consider (ratios 5–8) are listed at the bottom of the page.

## Liquidity and Solvency

*Liquidity*

Liquidity and solvency are essentially concerned with a school district's ability to pay its bills in the short and long run, respectively. As with financial position, the assessment of liquidity and solvency typically involves comparing a district's resources with its outstanding debts. For example, the *current ratio* (ratio 9) can be used to assess a district's ability to raise resources to cover its obligations over the coming year.

...the assessment of liquidity and solvency typically involves comparing a district's resources with its outstanding debts.

Current assets are those that are expected to be liquidated within a year, and current liabilities are those that are expected to come due within a year. This current ratio means that Example ISD has current assets totaling approximately 2.6 times more than is needed to finance current liabilities.

A more stringent approach to liquidity might apply the *quick ratio* (ratio 10), which compares only the most liquid assets of a district—generally cash, near-cash assets such as money market funds, other short-term investments, and sometimes receivables—to its current liabilities.

This is a more conservative indicator of a district's ability to meet obligations, assuming implicitly that its current liabilities will come due so soon that certain current assets cannot be liquidated quickly enough to pay for them.

Some districts may present their statement of net assets in a *classified* format, meaning they show current assets and liabilities separately from noncurrent assets and liabilities. Many districts, such as Example ISD, do not; in such cases, difficulty may arise in discerning which assets and liabilities are current, and thus the governmental funds financial statements (tables 5 and 6) might be used alternatively. The governmental funds statements are prepared using the modified accrual basis of accounting and the current financial resources measurement focus, which means that the balance sheet generally only shows current assets and liabilities.

One potential complication related to modified accrual accounting is the liability called "deferred revenues." There are generally two reasons why the recognition of revenues may be deferred:

Ratio 5.—Financial position using revenues

Net assets ÷ total revenues *(or operating revenues)*

Ratio 6.—Change in financial position using revenues

Change in net assets ÷ total revenues *(or operating revenues)*

Ratio 7.—Financial position using fund balance

Fund balance ÷ total expenditures *(or revenues, operating revenues)*

Ratio 8.—Financial position using unreserved fund balance

Unreserved fund balance ÷ total expenditures *(or revenues, operating revenues)*

Ratio 9.—Current ratio

current assets ÷ current liabilities =

(114,097,223 + 12,182,730 + 21,971,257 + 2,257,000 + 3,486,756) ÷ (33,886,084 + 3,840,948 + 21,569,854) = 2.597

Ratio 10.—Quick ratio

(cash + current investments) ÷ current liabilities =

114,097,223 ÷ (33,886,084 + 3,840,948 + 21,569,854) = 1.924



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(1) If a district receives resources that require it to provide certain services or meet specific conditions, those resources are not recognized as revenues until the services have been provided or the conditions have been met.

(2) Under modified accrual, if the resources are not *available* during the year or soon enough thereafter to pay current liabilities, they are deferred. For instance, property taxes must be collected during the year or within 60 days of the end of the fiscal year in order to be recognized as revenue; anything expected to be collected *after* the 60-day period is deferred.

Deferred revenue is relevant to computing liquidity ratios because the comparison of liquid assets with current liabilities should include neither assets that are not generally available to satisfy liabilities, nor liabilities that are not liquidated in the traditional way. If a district has de-

Table 5.—Governmental funds balance sheet

Example Independent School District
Balance Sheet
Governmental Funds
As of June 30, 2002

| | General fund | Debt service fund | Other governmental funds | Total governmental funds |
|---|---|---|---|---|
| ASSETS | | | | |
| Cash and cash equivalents | $ 100,864,805 | $ 3,294,850 | $ 2,109,325 | $ 106,268,980 |
| Property taxes receivable, net | 10,341,512 | 1,841,218 | | 12,182,730 |
| Due from other governments | 15,105,826 | | 4,862,510 | 19,968,336 |
| Accrued interest | 504,757 | | | 504,757 |
| Due from other funds | 5,170,479 | 759,359 | 1,852,454 | 7,782,292 |
| Other receivables | 1,218,640 | 20,695 | 508,827 | 1,748,162 |
| Inventories—supplies and materials | 1,412,121 | | | 1,412,121 |
| Other current assets | 125,109 | | | 125,109 |
| Total assets | $ 134,743,249 | $ 5,916,122 | $ 9,333,116 | *$ 149,992,487* |
| LIABILITIES AND FUND BALANCES | | | | |
| Liabilities | | | | |
| Accounts payable and accrued liabilities | $ 30,270,632 | $ 8,740 | $ 933,434 | $ 31,212,806 |
| Due to other funds | 20,845,752 | | 5,503,492 | 26,349,244 |
| Due to other governments | 10,093 | | | 10,093 |
| Due to student groups | | | 256,183 | 256,183 |
| Deferred revenue | 12,283,000 | 1,774,202 | 1,243,438 | *15,300,640* |
| Amounts held for granting agencies | 233,035 | | | 233,035 |
| Total liabilities | 63,642,512 | 1,782,942 | 7,936,547 | *73,362,001* |
| Fund balances | | | | |
| Reserved | | | | |
| Inventories | 1,412,121 | | | 1,412,121 |
| Retirement of long-term debt | | 4,133,180 | | 4,133,180 |
| Encumbrances | 4,744,173 | | | 4,744,173 |
| Unreserved | | | | |
| Designated | 21,347,665 | | | 21,347,665 |
| Undesignated, reported in: | | | | |
| General fund | 43,596,778 | | | 43,596,778 |
| Special revenue funds | | | 1,396,569 | 1,396,569 |
| Total fund balances | 71,100,737 | 4,133,180 | 1,396,569 | 76,630,486 |
| Total liabilities and fund balances | $ 134,743,249 | $ 5,916,122 | $ 9,333,116 | $ 149,992,487 |

NOTE: Italicized numbers are those used in the ratios.

SOURCE: Adapted from Mead, Dean Michael. 2000. *What You Should Know about Your School District's Finances: A Guide to Financial Statements.* Norwalk, CT: Governmental Accounting Standards Board.



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Table 6.—Governmental funds statement of revenues, expenditures, and changes in fund balances

Example Independent School District
Statement of Revenues, Expenditures, and Changes in Fund Balances
Governmental Funds
For the Year Ended June 30, 2002

| | General fund | Debt service fund | Other governmental funds | Total governmental funds |
|---|---|---|---|---|
| REVENUES | | | | |
| Property taxes | $153,862,367 | $16,589,425 | | $ 170,451,792 |
| Interest | 7,077,388 | 194,926 | $ 124,789 | 7,397,103 |
| Tuition charges | 1,283,778 | | 4,225,941 | 5,509,719 |
| Facility rental fees | 2,437,009 | | | 2,437,009 |
| State revenues | 188,019,530 | | 6,135,833 | 194,155,363 |
| Federal revenues | 2,284,748 | | 22,095,410 | 24,380,158 |
| Other | 107,604 | | 441,559 | 549,163 |
| Total revenues | 355,072,424 | 16,784,351 | 33,023,532 | 404,880,307 |
| EXPENDITURES | | | | |
| Current | | | | |
| Instruction and instructional-related services | 206,958,475 | | 25,936,202 | 232,894,677 |
| Instructional and school leadership | 31,485,279 | | 1,825,705 | 33,310,984 |
| Support services—student | 34,010,001 | | 3,003,049 | 37,013,050 |
| Administrative support services | 9,290,149 | | | 9,290,149 |
| Support services—nonstudent-based | 55,615,563 | | 1,308,415 | 56,923,978 |
| Community services | 1,691,107 | | 1,040,189 | 2,731,296 |
| Debt service | | | | |
| Principal | 1,160,471 | 11,985,914 | 380,561 | 13,526,946 |
| Interest | 378,447 | 3,908,791 | 124,107 | 4,411,345 |
| Capital outlay | 922,537 | | 8,327 | 930,864 |
| Total expenditures | 341,512,029 | 15,894,705 | 33,626,555 | 391,033,289 |
| Excess (deficiency) of revenues over expenditures | 13,560,395 | 889,646 | (603,023) | 13,847,018 |
| OTHER FINANCING SOURCES (USES) | | | | |
| Proceeds from capital leases | | | 692,245 | 692,245 |
| SPECIAL ITEM | | | | |
| Proceeds from sale of unimproved land | 2,601,908 | | | 2,601,908 |
| Net change in fund balances | 16,162,303 | 889,646 | 89,222 | 17,141,171 |
| Fund balance—Beginning | 54,938,434 | 3,243,534 | 1,307,347 | 59,489,315 |
| Fund balance—Ending | $ 71,100,737 | $ 4,133,180 | $ 1,396,569 | $ 76,630,486 |

SOURCE: Adapted from Mead, Dean Michael. 2000. *What You Should Know about Your School District's Finances: A Guide to Financial Statements.* Norwalk, CT: Govemmental Accounting Standards Board.

ferred revenues that are significant relative to either its assets or liabilities, then the deferred revenues should be subtracted from the liabilities in the denominator of the ratio.[6] A current ratio calculated from table 5 is shown in ratio 11.

The determination of what is an acceptable level of liquidity is subjective, but it may be said that "acceptable" depends on some cushion of resources above and beyond what is necessary to

Ratio 11.—Current ratio from table 5 (without deferred revenues)

149,992,487 ÷ (73,362,001 – 15,300,640) = 2.583

[6] In the case of deferred revenues related to conditions that must be met or actions that must be taken, you may also want to subtract the related assets—typically cash or receivables—if they are significant relative to total assets.

exactly cover obligations. In other words, a precise match of resources and obligations—a ratio of 1.0—leaves no room for the unforeseen. If certain receivables are not actually received, then resources may not be available to finance obligations when they come due. Consequently, you may seek a ratio that indicates some slack to meet contingencies—whether that ratio is 1.5 or 3.0 or somewhere in between depends on particular interests.

Proper interpretation of liquidity ratios requires an understanding of a district's cash flow patterns. Because the ratios are based on information as of the *end* of the fiscal year, they may not accurately reflect the availability of cash in all situations. For example, a district might have a low current ratio as of the end of the year, but not have a liquidity problem if it receives a substantial portion of its property taxes early in the year. By contrast, a high liquidity ratio may be the result of state aid payments that are received just prior to the end of the year. As long as the circumstances of a particular district are understood, a knowledgeable comparison of these ratios with prior years and with other districts is possible.

*Solvency*

Solvency ratios come in two general forms—*leverage ratios* and *coverage ratios*. Leverage is the degree to which a district's assets are financed through borrowing and other long-term obligations. The *debt-to-assets ratio* (ratio 12) divides total liabilities by total assets. The *debt-to-net-assets ratio* (ratio 13) divides total liabilities by net assets.

The first calculation produces a ratio of 0.36, which means that more than one-third of the district's assets are financed with debt. The latter ratio is 0.55, meaning for every dollar of resources the district has available to use for providing public services, it owes 55 cents.

*Times-interest-earned* is a coverage ratio that compares cash flows generated by operations to interest payments on debt. *Debt service coverage* compares cash flows to a district's entire debt repayments, both interest and principal. The difficulty that will be faced will be trying to calculate coverage ratios without cash flow information for the district's governmental activities. (By contrast, accounting rules require districts to prepare a cash flow statement for their enterprise funds, which in most cases are the same as their business-type activities.)

If cash flow information cannot be obtained from a district, the alternative within the financial statements is complicated. In order to calculate the ratio, the missing cash flow information for governmental activities must be replaced with second-best information—the difference between revenues and expenditures in the governmental funds statements (table 6). This is problematic on at least two levels:

(1) Because the governmental funds information, as noted, is prepared on a modified accrual basis, not on a cash basis, the information may overstate or understate actual cash flows.

(2) The "excess (deficiency)" amount in the governmental funds includes expenditures for capital projects, as well as for debt service, neither of which would be reflected in a "cash flow from operations" amount if one existed. Consequently, the alternative equation

Proper interpretation of liquidity ratios requires an understanding of a district's cash flow patterns.

Ratio 12.—Debt-to-assets ratio

total liabilities ÷ total assets = 168,090,633 ÷ 472,052,627 = 0.356

Ratio 13.—Debt-to-net assets ratio

total liabilities ÷ total net assets = 168,090,633 ÷ 303,961,994 = 0.553



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should include just the revenues and *current* expenditures of the general fund and special revenue funds.[7]

In light of these potential problems, the uncertainties surrounding the information produced by coverage ratios may outweigh the effort to calculate them. The times-interest-earned ratio is shown in ratio 14.[8] The formula for the debt service coverage ratio is shown in ratio 15.[9]

The debt-to-assets ratio suggests whether a district has the resources needed to repay its long-term debts. The ratio of 0.36 calculated above implies that, to repay the debts immediately would require the liquidation of 36 percent of the district's assets. Is this possible? For some districts, capital assets such as school buildings and buses represent the overwhelming majority of assets; such assets are not easily liquidated, and the district could not continue to operate if they were sold off. Nevertheless, it is commonplace to issue long-term debt to finance capital assets and repay it roughly over the useful life of the assets. The appropriate level of outstanding debts relative to assets is a subjective judgment call.

The debt-to-net-assets ratio may be considered a reflection of who owns a district's assets, the district or its creditors. All other factors being equal, persons who have completely paid for their homes might appear better off than persons with 15 years left on a 30-year mortgage.

Judgments about coverage ratios vary like liquidity ratios, depending upon what is considered to be a comfortable or acceptable cushion of additional resources to cover debt. In other words, it depends on how far above 1.0 the ratios must be to assure an analyst that debt can be repaid regardless of unforeseen events. Additional ratios to consider (ratios 16 and 17) are listed at the bottom of the page.

...the uncertainties surrounding the information produced by coverage ratios may outweigh the effort to calculate them.

Ratio 14.—Tmes-interest-earned ratio

(cash flow from operations + interest expense) ÷ interest expense =

(general fund revenues + special revenue fund revenues – general fund current expenditures – special revenue fund current expenditures + enterprise funds cash flow from operations + total interest on long-term debt for governmental and business-type activities) ÷ (total interest on long-term debt for governmental and business-type activities)

Ratio 15.— Debt service coverage ratio

(cash flow from operations + debt service) ÷ debt service =

(general fund revenues + special revenue fund revenues – general fund current expenditures – special revenue fund current expenditures + enterprise funds cash flow from operations + total interest on long-term debt for governmental and business-type activities + total principal repayments for governmental and business-type activities) ÷ (total interest on long-term debt for governmental and business-type activities + total principal repayments for governmental and business-type activities)

Ratio 16.—Liabilities as a share of annual revenues

Liabilities ÷ total revenues *(or operating revenues)*

Ratio 17.—Resources devoted to repaying debt

Debt service ÷ total revenues

[7] Under "major fund" reporting, the general fund or its equivalent will always be shown on the face of the statement. However, only the *major* special revenues funds will be shown individually. You will need to determine if there are additional special revenue funds included in the nonmajor "other governmental funds" column. This can be easily accomplished if a school district includes a combining statement of nonmajor governmental funds in its comprehensive annual financial report.

[8] Interest on long-term debt for governmental and business-type activities can be found in the district-wide statement of activities (table 2).

[9] Principal repayments may be found in the required note disclosure for long-term liabilities activity. See figure 12 in Mead (2000).



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## Fiscal Capacity

Fiscal capacity is a district's ability to raise resources to finance the provision of the services its constituency demands. The simplest measures of fiscal capacity combine financial statement information with economic and demographic data. These ratios compare revenues, expenses, and outstanding debts with indicators that imply a constituency's wherewithal to pay for services. Much of the information you would use could be found in a district's comprehensive annual financial report (CAFR), or can easily be found at federal government Internet sites.[10] Three common indicators to which financial information may be compared are property values, personal income, and population (ratios 18–20).

Any of these ratios could also be calculated with revenues or expenses in the numerator instead of liabilities. Specific revenues can also be compared with their relevant economic bases, such as *property tax revenues per $100 of assessed value*. Such a calculation produces an *effective* tax rate—the amount *actually recognized* relative to the value of property owned, rather than the amount *levied*.

Population is frequently used to place financial information in a metric that is easily compared with other school districts. Sometimes the population used is that of a district's geographic area, such as *property taxes per capita*. Other times the *student* population is utilized, such as *spending per pupil* or *state aid revenue per pupil*. Additional ratios to consider (ratios 21–23) are listed at the bottom of the page.

## Risk and Exposure

A school district's ability to withstand financial difficulties can be as important to judgments about financial condition as its ability to raise revenues. One measure of such capacity is *revenue dispersion*. The degree of dispersion or diversity in a district's sources of revenue can tell something about its exposure to financial difficulty if a particular revenue source dries up. By examining the individual components of total revenues, it might be found that a district relies on a broad range of revenues to support its activities, and therefore is relatively less likely to be dramatically affected if one type of revenue does not meet expectations. Alternatively, it might be found—as is often the case—that the district relies heavily on one or two sources of revenue, such as property taxes and state formula aid. Reductions in those kinds of revenues could harm a district financially because it is very dependent on them to run its operations.

A school district's ability to withstand financial difficulties can be as important to judgments about financial condition as its ability to raise revenues.

Ratio 18.—Debt per $100 of assessed property value
(total liabilities x 100) ÷ total assessed property value
Ratio 19.—Debt per $1,000 of personal income
(total liabilities x 1,000) ÷ total personal income
Ratio 20.—Debt per capita
total liabilities ÷ total population
Ratio 21.—Taxes per capita
Tax revenues ÷ population
Ratio 22.—Taxes as a share of personal income
Tax revenues ÷ personal income *(or assessed value)*
Ratio 23.—Expenses per capita
Expenses ÷ population

[10] For example, useful information can be obtained from the U.S. Bureau of the Census, http://www.census.gov, the Bureau of Economic Analysis, http://www.bea.doc.gov, and the National Center for Education Statistics, http://nces.ed.gov.



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Revenue dispersion is simple to derive, being just a percentage distribution calculation. Each individual revenue source is divided by total revenues (and then multiplied by 100) to reveal its percentage or share of total.

More involved ratios include those developed by Bowman and Calia (1997 and 1999)—*risk exposure ratio* and *tax leverage ratio*. Although their work on governmental financial analysis was applied to fund financial statements, it can easily be adapted to the new district-wide statements required by GASB Statement 34.

The risk exposure ratio (ratio 24) focuses on revenue sources that are potentially subject to large, abrupt changes, specifically investment income and intergovernmental aid, the latter being particularly important to school districts. The ratio expresses the percentage increase in property taxes that would be required to make up for a 1 percent shortfall in those two sources of funding. It is calculated in ratio 24 using Example ISD's statement of activities (table 2): a 1 percent shortfall in those revenues would require a 1.4 percent increase in property taxes.

With the tax-raising capacity information in hand, the tax leverage ratio can be utilized to assess a district's ability to react to unplanned costs.

This information can be compared with the results found by calculating measures of fiscal capacity. If a district does not have much available capacity to raise taxes or to borrow because its taxes and debt are already relatively burdensome compared with other similar districts, then a high risk exposure ratio could be cause for concern. That district may not have the ability to effectively respond to a downturn in those revenue sources.

The tax leverage ratio (ratio 25), like risk exposure, is expressed as a percentage increase in property taxes. In this case, the ratio shows how much property tax revenue would need to increase to cover a 1 percent increase in costs. Again using the Example ISD data shown in table 2 (in order to get operating expenses, first remove depreciation[11] and interest on long-term debt), the result shows that a 1 percent increase in operating expenses would require an increase in property taxes of almost 2.3 percent. With the tax-raising capacity information in hand, the tax leverage ratio can be utilized to assess a district's ability to react to unplanned costs. Additional ratios to consider (ratios 26 and 27) are listed at the bottom of the page.

## Other Factors

Of course, financial statements are only one source of information that is relevant to assessing a school district's financial statements. Useful financial information can also be found in the statistical section of a district's CAFR, in budget documents, and in the official statements districts publish when preparing to issue bonds or notes.

Ratio 24.—Risk exposure ratio

(investment revenue + intergovernmental aid) ÷ property tax revenue =

(7,709,374 + 59,222,036 + 750,000 + 176,265,211) ÷ (154,108,322 + 16,860,557) = 1.4268

Ratio 25.—Tax leverage ratio

operating expenses ÷ property tax revenue =

(410,123,330 – 6,555,053 – 6,554,236 – 5,969,465) ÷ (154,108,322 + 16,860,557) = 2.287

Ratio 26.—Magnitude of property tax receivables

Property tax receivables ÷ current assets *(or property tax levy)*

Ratio 27.—Magnitude of unpaid property taxes

Uncollectable property taxes ÷ property tax levy

[11] The figure of $6,554,236 is depreciation expenses allocated directly to the functions and programs listed in the statement of activities (table 2), and can be found in the required note disclosure regarding capital asset activity during the year. See figure 11 in Mead (2000) for an example.

An important financial issue that may be overlooked is district employee pensions, which often are a district's largest long-term obligations. Financial reporting rules require school districts that participate in a pension fund (or that operate their own fund) to report information about the size of their pension obligations and the extent to which resources have been set aside to fund those obligations.[12] The information can be found in a district's required supplementary information accompanying its financial statements. This information includes several ratios (ratios 28–30) that indicate the funding status of pensions (for the last 3 or 6 years).

There is also a considerable amount of additional information that can shed light on a government's financial health. Berne (1992) cites a lengthy list of items, including:

- Economic and demographic information, such as population, school-age population, birth rates, percentage of population in poverty, employment, and industrial structure
- Revenue base information, such as property values, retail sales, and personal income
- Service performance information, including indicators of:
  - Service demands—enrollment in regular and special education, percentage of non-English-speaking students, poverty levels
  - Service efforts—numbers and types of employees, class sizes
  - Service accomplishments—percentage of students graduating, test scores

Finally, it may not be sufficient to know about a district's *capacity* to raise resources and to provide services, but also its *willingness* to do so. For example, fiscal capacity ratios may suggest that it is feasible to raise additional tax revenues, but a district's board members may be unwilling to increase tax rates. Alternatively, a tax increase may require voter approval, or a state law may prevent a district from raising taxes. Valuable information regarding these issues can be found in policy statements, press releases, strategic plans, newspaper and magazine articles, and certainly school district Web sites. State departments of education typically also have informative Web sites with both financial and nonfinancial information. Additional ratios to consider (ratios 31–37) are listed at the bottom of the next two pages.

An important financial issue that may be overlooked is district employee pensions, which often are a district's largest long-term obligations.

Ratio 28.—Pension funding status
Actuarial value of pension fund assets ÷ unfunded actuarial accrued liability
Ratio 29.—Unfunded pension liability as a share of payroll
Unfunded actuarial accrued liability ÷ covered payroll
Ratio 30.—Actual versus required pension contributions
Actual pension contribution ÷ actuarially required contribution
Ratio 31.—Employees per capita
District employees ÷ population
Ratio 32.—Employees per pupil
Teachers *(or administrative staff)* ÷ student enrollment
Ratio 33.—Magnitude of unfunded pension liability
Unfunded pension liability ÷ assessed value *(or revenues, personal income)*

[12] At present there are no similar rules for reporting information about other benefits provided to retirees, such as health insurance. However, the GASB's current technical plan envisions proposing new rules early in 2002 for reporting "other postemployment benefits" (OPEB).



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## A Note on Comparative Financial Information

This discussion of financial condition has focused predominantly on financial information drawn from school district financial statements. It is suggested that the analyst of school district finances build a comparison group of similar school districts against which the financial status of a school district may be framed. However, some may consider the process of calculating ratios from the financial statements of multiple school districts over several years to be too cumbersome or time consuming. An alternative source of handy financial information may be the National Center for Education Statistics (NCES).

Used in conjunction, these multiple types of financial information should provide a more comprehensive and definitive picture of a school district's financial condition than either would on its own.

The NCES is a unit of the U.S. Department of Education that, among other activities, compiles and disseminates financial and nonfinancial information about public elementary and secondary education. The greatest strengths of the NCES's databases, such as the one derived from its annual survey of school system finances (the "F-33" form) or its Common Core of Data (CCD), are their ease of use and comparability. The information is easily manipulated with just about any spreadsheet or statistical software. For instance, with little difficulty an analyst could sort the information by school district size (i.e., number of pupils), cut and paste 10 or 20 or more districts of a relevant size, aggregate their information and compute comparison group average ratios.

The greatest asset of NCES's information is the assurance of comparability and consistency it provides. The categories of information requested in the underlying survey for the F-33 database are based on a common chart of accounts that reflects the data that state education agencies collect. This means the user of the database can be reasonably certain that the information is comparable across districts and consistent over time.

The NCES data is not without its shortcomings, however. First, the information is not very timely. Analyst complaints that school district financial statements are not available for some 4 to 6 months after the end of the fiscal year pale in light of the 2- to 3-*year* lag in NCES data. Thus, although the NCES information can provide valuable cross-sectional and trend series comparisons, it is not up-to-date. Alternatively, state governments generally collect standardized financial information that is fresher than the NCES data, though typically more than one or two years old. Second, the categorization of information in the NCES databases (as well as that of the state-gathered information) is *not* the same as you will find in a school district's financial statements. In other words, the two cannot be reliably compared.

Nevertheless, these information sources and others are very important and informative companions to financial statement-oriented analyses. The relative strengths and weaknesses of each are complementary. For its part, audited financial statement information is more timely and offers a level of assurance of reliability that may not be present in other data sources. Used in conjunction, these multiple types of financial information should provide a more comprehensive and definitive picture of a school district's financial condition than either would on its own.

Ratio 34.—Magnitude of maintenance costs
Maintenance and repair expenses ÷ capital assets
Ratio 35.—Magnitude of capital investment
Capital expenditures ÷ student enrollment *(or capital assets)*
Ratio 36.—Annual consumption of capital assets
Depreciation expense ÷ capital assets
Ratio 37.—Expired portion of capital assets useful lives
Accumulated depreciation ÷ capital assets



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The opinions stated in this paper are those of the author. Official positions of the GASB are established only after extensive due process and deliberation.

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Selected Papers in School Finance, 2000–01

# A Synthesis of Two Approaches to School-Level Financial Data:

# The Accounting and Resource Cost Model Approaches



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# A Synthesis of Two Approaches to School-Level Financial Data:

# The Accounting and Resource Cost Model Approaches

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# A Synthesis of Two Approaches to School-Level Financial Data: The Accounting and Resource Cost Model Approaches

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## Introduction

### Purpose

For the past several years, there has been considerable interest in measuring educational expenditures at the school level for the purpose of linking student costs to student results. This attention has developed as a variety of interested parties and issues have converged around the efforts of improving the effectiveness and efficiency of schools. A common concern among school administrators, policymakers, and researchers is the lack of reliable school-level data on which to make effective resource allocation decisions based on informed education policy. "School-level data on public school expenditures are not generally available to inform education policy discussions regarding how resources are allocated both within and among schools" (Issacs et al. 1998).

Two alternative approaches to the development of school-level data for financial reporting and resource analysis have emerged to address the data needs of administrators, policymakers, and researchers. The two approaches are:

*Accounting approach*
A downward extension of the present district-level accounting system to report expenditures by individual school buildings.

*Resource cost model (RCM) approach*
Use of physical resource data as the basis of measuring resource use and translating the consumption of resources into costs.

The purpose of this paper is to provide an analysis of the strengths and weakness of these approaches with the objective of developing a synthesis of their methodologies that combines their best features and avoids their primary problems. The synthesis leads to recommendations for the content and format of school-level financial and resource data to be collected and reported by school districts.

### Previous NCES Working Papers

The National Center for Education Statistics (NCES) has taken a lead role in the inquiry of school-level data and commissioned several recent studies of both major

approaches. This paper draws on the findings and analyses of these studies in the examination of the accounting and resource cost model (RCM) approaches to developing and using school-level financial and productivity data.

Sherman, Best, and Luskin (1996) analyzed available financial data from two states that implemented data collection at the school level. The analysis determined school-level expenditure amounts for major functions and instructional programs and then examined the variations in expenditures among functions and programs across schools in each state. Drawing on the insights from working with the data available from these states' accounting systems, a series of recommendations were developed for the design of a model school-level data collection system.

This report focuses on two approaches to measurement of resources in education: an accounting approach and a resource-based approach.

Issacs et al. (1999) examined the feasibility and difficulties in collecting more detailed staffing resources and expenditures at the school level through the Schools and Staffing Survey (SASS). As described in the NCES abstract:

> This working paper summarizes a series of tasks undertaken to assess the feasibility of extending the resource and finance data collected in the SASS. It includes an overview of the RCM, instruments designed to collect staffing data, an appraisal of earnings data from the Current Population Survey (CPS) to estimate salaries for school staff, options for gathering benefits data, an approach to collecting traditional finance data at the school level, and a discussion of the analytical value of an integrated collection of both staffing resource and expenditure data.[1]

In the third report, Chambers (1999) compared the two alternative approaches with measuring resources in K–12 education that are the focus of this study—the accounting approach and the RCM approach.

> This report focuses on two approaches to measurement of resources in education: an accounting approach and a resource-based approach. The accounting approach measures resources in dollars of expenditure. The resource-based approach emphasizes the measurement of resources in terms of physical ingredients, such as teaching staff. The comparison of the accounting and the resource-based approaches explores the differences in the way accountants and economists view the concepts of cost and expenditure. The report focuses on the development of a framework for organizing and analyzing programmatic cost, expenditure, and resource data for local educational agencies serving elementary and secondary students.[2]

## Stakeholders and Uses of Data

The first questions to consider are who will be the primary users of school-level data, what new data do they need, and for what purposes will the data be used? Without a clear understanding of these items, there can be no reference point from which to choose among competing directions. Principal stakeholders can be divided into three general groups based on their interests in and uses for school-level financial data: schools and school districts; state and national policymakers; and researchers and policy analysts. A fourth and more diverse group of stakeholders consists of the public, represented by parents and taxpayers of individual school districts, special interest groups in education, and the financial community. While members of this group are generally not directly involved in data collection or analysis, they are an important

[1] National Center for Education Statistics website, NCES Electronic Catalog, Product Information Page, NCES 1999-07.

[2] Ibid.

audience for school-level information and have strong interests in the results, although from different perspectives.

If successful, either or both of the approaches to developing school-level financial and resource data will provide more detailed information on how schools spend their funds and allocate their resources. However, the critical issues are: what new data are needed for what purposes; which approach or combination of approaches can best obtain the data; and if the benefits from such data collection, reporting, and analysis are worth the cost of obtaining them. As a framework for understanding the cycle of collection, reporting, and use of school-level data, table 1 illustrates the interrelationships among primary stakeholders that would be involved in the process.

To begin, it is useful to establish that the primary focus of each group is somewhat different. While at the fundamental level, all groups are certainly interested in improving schools, raising student achievement, and efficient operations, they approach these goals from different perspectives related to their positions and responsibilities.

School and district administrators have as their primary responsibility the operation of schools. As such, they are interested in information that will allow the schools and the district to function effectively and efficiently in compliance with state and federal laws and regulations. From a fiscal perspective, they are concerned with creating a feasible budget, monitoring expenditures to stay within the budgeted amounts, and developing fiscal reports that inform them of the status of their operations and allow them to report the results to a variety of audiences. Beyond day-to-day operations, administrators are also interested in improving the current operating conditions of their schools, which can be done by spending comparisons with similar schools and from research findings.

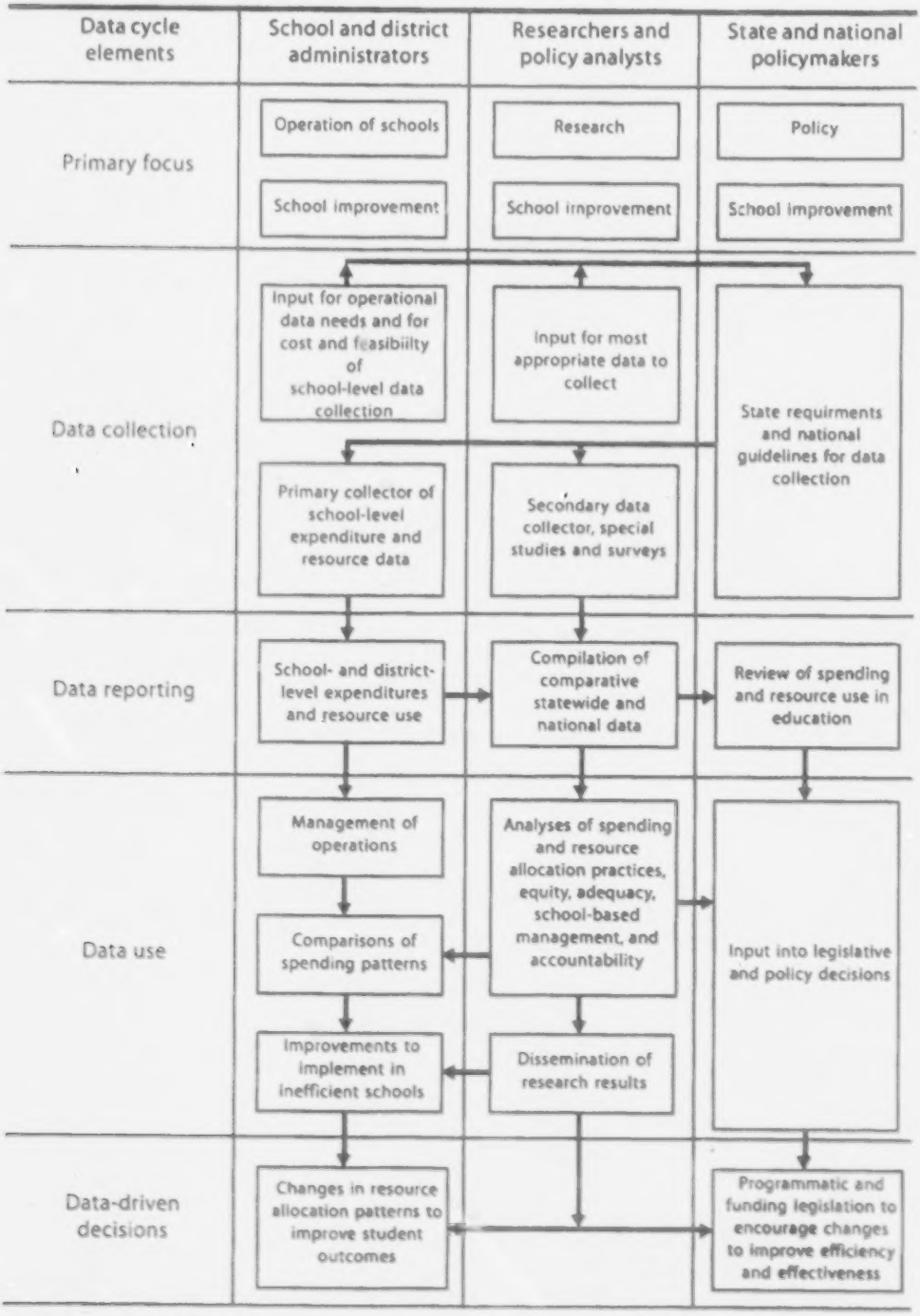
The role of researchers and policy analysts is to examine how schools organize their resources and operate their various programs to achieve student outcomes. Their goal is to understand what levels of resources organized in what schemes are effective in achieving high level results for different kinds of students. As such, they are less interested in precise dollar amounts at the school level, which are distorted by various factors that make expenditure data non-comparable across schools, districts, or states. Rather they are more concerned with measuring resources that are used in the educational process and how they are combined into effective and ineffective programs at the school level. The studies from this research effort provide insight to school and district administrators on how to improve their programs and guidance for state and national policymakers in setting educational fiscal and program policy.

The role of researchers and policy analysts is to examine how schools organize their resources and operate their various programs to achieve student outcomes.

The final group, state and national policymakers, establish requirements and guidelines for data collection and reporting for schools and districts. They need to consider their own informational needs for accurate and timely data and analyses to assist them in making data-driven decisions. Additionally, the rules that they establish impact upon the other two groups in the form of mandates for specific data collection and reporting, potential omission of certain useful data, and, most importantly, the availability of school-level data for management, comparison of spending and resource use, and fiscal and programmatic analyses.

It is important, if not essential, to recognize the interests and needs of the multiple audiences and users of school-level data. Given the different interests, a single approach to school-level financial and resource data collection and reporting may not effectively serve the needs of the various groups. For example, an accounting system that provides for the collection of school-level expenditures may be the most useful approach for groups that require actual expenditure data to manage opera-

Table 1.—Data cycle for school-level data


Data cycle elements
School and district administrators
Researchers and policy analysts
State and national policymakers
Primary focus
Operation of schools
School improvement
Research
School improvement
Policy
School improvement
Data collection
Input for operational data needs and for cost and feasibiilty of school-level data collection
Input for most appropriate data to collect
State requirments and national guidelines for data collection
Primary collector of school-level expenditure and resource data
Secondary data collector, special studies and surveys
Data reporting
School- and district-level expenditures and resource use
Compilation of comparative statewide and national data
Review of spending and resource use in education
Data use
Management of operations
Comparisons of spending patterns
Improvements to implement in inefficient schools
Analyses of spending and resource allocation practices, equity, adequacy, school-based management, and accountability
Dissemination of research results
Input into legislative and policy decisions
Data-driven decisions
Changes in resource allocation patterns to improve student outcomes
Programmatic and funding legislation to encourage changes to improve efficiency and effectiveness

SOURCE: Authors' sketch.

tions (administrators), and to understand spending (taxpayers, parents, financial analysts), as well as to make informed decisions in accordance with fiscal policy, regulations, and laws (school boards, state and national policymakers). However, researchers would find only expenditure data insufficient to conduct reliable studies about effective and efficient educational programs; rather they would be more interested in detailed school-level staffing data, and, perhaps, not even require actual expenditure data. Consequently, it is important to consider and balance the interest and needs of the different groups along with the value and cost of obtaining the information in the formulation of a school-level data collection and reporting system.

## Schools and School Districts

The first major group of stakeholders represents schools and school districts. This group includes school administrators, district administrators (primarily superintendents and school business officials), and school boards. Others, such as school staff and parents, also have interests in school-level data. Principals and their staff, along with school business officials at the district office, would be the main *producers of school-level data*. There is a division of labor in most school districts between school and district office personnel and, depending on the type of expenditure, the responsibility for making and recording the expenditure may fall to either level. For example, the human resources (personnel) or business office staff at the district level usually handle all personnel data (salaries and benefits), while school level staff initially record many nonpersonnel instructional expenditures into the accounting system under rules and policies set by the central administration and school board. Support expenditures related directly and entirely to a single school can be the responsibility of the school, but activities or programs that serve multiple schools or the entire district will be the province of the district office.

In addition to data collection, the district has the responsibility for maintaining fiscal records and reporting fiscal data to the school board, public, and state. At the district level, individual school expenditures can be maintained separately as well as being aggregated and combined with district-level expenditures to arrive at total district expenditure amounts. Districts also are required to report expenditures to the state in a standardized format so that state reports may be produced. With school-level financial data, the district would report not only district totals, but also required school expenditure amounts, again in accordance with a state-established format.

As noted previously, a primary responsibility of school and school district administrators is fiscal management and financial compliance. They are required to maintain individual school and overall district expenditures within the budget approved by the school board and in accordance with state and federal regulations and laws (Hartman 1999, 11–14). To this end, they will look to school-level financial data as input into developing their budget and as a tool for monitoring expenditures during the year.

...a primary responsibility of school and school district administrators is fiscal management and financial compliance.

Beyond fiscal management, an important use of school-level data for this group would be as a tool for school improvement. These data could serve as the basis for comparisons of expenditure patterns among different schools within their district. These comparisons would seek to identify areas of differences and possible changes that could be made in their resource allocation decisions to achieve improvements at the school and district levels. In addition to these internally generated comparisons, all school and district stakeholders will be interested in state and national summary reports prepared by the respective educational agencies that provide comparisons for measuring their expenditures against state and national averages.

Also, research reports by state and national researchers can identify good or best prac-

tices in the manner in which effective schools allocate resources. Such information could be used to improve the effectiveness and efficiency of the programs in other school districts. However, before committing significant funds, time, and energy into program changes, a district will want to be confident that the analyses are valid and that the improvements can be effectively implemented in their schools.

At the same time, a significant concern of this group is the burden of data collection and reporting that they would face under a school-level data system. The burden would consist of the time required of various personnel at the school and district level along with the expenses associated with changing and maintaining new data systems. This is particularly true if the main immediate beneficiaries of the data would be other groups. Therefore, if substantial administrative burden and expense are incurred to develop and maintain a school-level data system, there will need to be compensating benefits of an immediate and concrete nature in order for districts to participate willingly and conscientiously in such an effort. Otherwise, such a burden will be viewed as another unfunded mandate without any useful benefit to the mission of the school.

To fulfill their role, researchers need appropriate data to analyze school-level resource allocation patterns and student outcomes.

The interests and concerns of school boards would be similar to school administrators, but emphasizing their primary role of oversight of fiscal and program operations. They would establish local policies for school-level data collection and reporting systems that would be followed by administrators. A significant concern among this group also would be the costs of establishing and maintaining a school-level data system. For their part, board members could use the more detailed school-level information to provide closer scrutiny of the operations in individual schools. This scrutiny would include monitoring spending, reviewing individual school performance, comparing schools on key measures, and identifying appropriate improvements in school programs and operations. They also would have interest in research reports providing analyses of effective programs and practices that could be compared to their current programs and practices as a means to effect positive change.

### Researchers and Policy Analysts

This group includes researchers and policy analysts primarily at the state and national levels. Members of this group would be the major *consumers of school-level data*. Their role is to inform the policymakers and school administrators and provide a valid basis for others to make resource allocation decisions. With more extensive school-level information they could conduct a variety of analyses that would improve the knowledge base of effective and efficient school programs and practices. Examples would be analyses of spending patterns among schools, relationship of resource allocation practices and student outcomes, studies of equity at the school level, adequacy of resources for achieving desired educational outcomes, school-based management, and accountability. Table 2 provides a more extensive list of policy issues that can be examined with greater thoroughness using school-level data. With these analyses this group becomes *producers of reports* that policymakers and school district personnel can utilize to improve their resource allocation decisions.

To fulfill their role, researchers need appropriate data to analyze school-level resource allocation patterns and student outcomes. Such data include expenditures, staff assignments, and student involvement in various programs and services, along with student outcomes. Consequently, the data needs of researchers and policy analysts may go beyond the immediate needs of school administrators, the group that must produce school-level data.

Researchers are also concerned with the costs of data collection, but for them it is the cost of getting data from schools and districts that is more important, not the costs of the school data systems. If data are already available at the school-level,

Table 2.—Policy issues related to school-level financial and resource data

| |
|---|
| **Resource allocation and productivity** |
| □ Basic information on level of spending at school level |
| □ Distribution of resources among different functions, objects, programs, and school/district activities |
| □ Relationships among choice, quantity, and utilization of resources with student outcomes |
| □ Analyses to inform local, state and federal policy makers for funding and resource allocation decisions |
| **Costs and effects of policy initiatives** |
| □ How do school reform proposals affect school-level staffing and costs? |
| **Equity** |
| □ Are resources distributed in an equitable manner across schools within a district or within a state? |
| □ Variations in per pupil expenditures among schools and the relationship with wealth and other variables |
| **Adequacy** |
| □ Do all schools have the minimum level of resources to provide an adequate level of educational services for learning? |
| □ What differential levels of resources are necessary for different student populations? |
| **School-based management** |
| □ Financial and resource allocation data to support school-level decision making |
| □ Benchmarking information for high-performing schools to serve as models for others |
| **Accountability** |
| □ Are resources being spent as intended? |
| □ Are schools achieving intended outcomes for their expenditures? |
| **Legislative and congressional interests and public inquiries** |
| □ Special requests for spending information at the school level or for special purposes |
| □ Topical analyses for specific topics |

SOURCE: Issacs, J.B., Garet, M.S., Sherman, J.D., Cullen, A., and Phelps, R. 1999. *Collection of Resource and Expenditure Data on the Schools and Staffing Survey.* Washington, DC: U.S. Department of Education, National Center for Educational Statistics. (Working Paper 1999–07).

then it is much simpler, less expensive, and probably more accurate to obtain them directly from an existing school-level data system than if a special one-time collection is required.

A second issue in this area is comparability of data. To be able to make meaningful analyses beyond a single school or district, it is necessary that data be collected and reported in a comparable fashion for all entities. This involves some degree of standardization of definitions, measures, and practices across a state or even nationally. Without a common agreement on such questions as what constitutes a school, treatment of personnel benefits, or allocation of personnel that serve multiple buildings or programs, then it becomes problematic to develop consistent and valid analyses. These last two points highlight the need to have the input of researchers into the design of any state or national school-level data system to balance their needs with those of school personnel who will be operating the system.

## State and Federal Policymakers

This last group represents a diverse collection of different constituencies with the common interest of understanding and im-

proving education. They include state policymakers and staff (Legislators, legislative staff, Governors and staff, state Departments of Education) and federal policymakers and staff (Legislators, legislative staff, President and staff, U.S. Department of Education). They are the primary *consumers of information and reports* produced by researchers and policy analysts. They use the information from analyses for a variety of purposes: to establish funding levels; to develop resource allocation legislation, policies, and guidelines; to create new initiatives; to encourage effective learning approaches; and to answer topical questions on school spending and productivity. New school-level data and analyses would provide greater information for these decisions. Of particular benefit is that attention could be focused on school and program levels, or even grade levels and academic subjects. With more detailed information, decisions would be less reliant on aggregated district-level data that can conceal disparate operations and conditions among individual schools and within schools.

...school-level data would allow state and federal agencies to monitor the achievements of schools in closer detail.

In addition, school-level data would allow state and federal agencies to monitor the achievements of schools in closer detail. Rather than being restricted to district-level measures and district-to-district comparisons to measure equity, school-level data would provide the opportunity for intra-district analyses and comparisons of similar schools across a state or nationally. Such school-level cost data when combined with student outcome measures may assist in determining what funding and resource allocation practices work best for various kinds of students. These analyses can identify best practices for instructional delivery and enable examinations of accountability. The inquiries and comparisons can then feed into legislation and policies that direct and redirect resources for education.

Finally, these groups establish the requirements and guidelines for data production by schools and districts. State legislatures and departments of education generally determine educational accounting systems, data reporting obligations, and other data collection practices. However, the federal government, through its financial accounting handbook series (Fowler 1997) that gives a suggested chart of accounts and accounting procedures for states, has influenced states' practices and encouraged a general uniformity among state educational accounting systems.

Policymakers are also mindful of the burdens that their data requirements impose on school districts. While new and improved data for program and funding decisions are useful, they may not be mandated if they are perceived as too expensive or detailed.

## School-level Data

School-level data of interest to the major stakeholder groups are of three main types: actual expenditures and costs,[3] staff, and students. Schools often have different systems for collecting and reporting each type, but frequently the different systems are not integrated with each other nor even use a common basis for categorizing their data elements.

### Expenditure Data

District expenditures can be divided into four types, depending on where they are incurred and for what purposes. These distinctions affect both who is involved in the data collection and what types of data are available.

#### *Direct expenditures identifiable with an individual school*

These are the most straightforward types of expenditures for school-level data reporting. They are completely and unambiguously identified with a single school. Examples include salaries and benefits for staff assigned full-time to a particular

[3] Expenditures are the dollar amounts spent for activities, while costs represent the resources consumed by those activities.

school (teachers, other professional staff, administrators, and classified staff), classroom supplies, and computer hardware and software purchased by the school. As long as the accounting system has an individual school code attached to these expenditures, they are associated with an individual school.

*Joint expenditures made at the school level for more than one school*

Expenditures of this type are for personnel or nonpersonnel objects that serve several schools. The primary example of joint expenditures is salaries and benefits for instructional or support personnel serving multiple schools, such as speech therapists, school nurses, or librarians. Whether these costs are shown for each school, for a single school, or in some central office account depends on district practice. If staff assignments are for full-time equivalent (FTE) positions for each school, then the accounting system can allocate personnel expenditures to each school based on its share of the FTE for each person. If this is not the case, then these expenditures could be allocated to individual schools on some reasonable basis (e.g., percentage of time spent in each school, percentage of students served in each school) and should reflect the proportion of these resources devoted to the school.

*Expenditures made centrally for services identifiable by school*

These expenditures are similar to the previous category in that they are for programs, objects, or services for students that can be identified by an individual school or groups of schools. However, they are controlled by and made at the central office rather than the school level. The student specific expenditures could be allocated to individual schools based on the number of children or percentage of students in each school (e.g., medical services). Joint expenditures for multiple schools could be allocated to individual schools on a reasonable basis reflecting their portion of resources devoted to the school (e.g., costs of elementary curriculum coordinators divided among elementary schools based on the number of students in each school or the number of elementary schools). Expenditures that can be associated with specific schools can be assigned directly to each school (e.g., utilities, if consumption can be broken out by school).

*Central office expenditures made for the entire district*

Some of the expenditures cannot be directly associated with an individual school or group of schools. These are the district-level expenditures for programs, functions, and services for the entire district. Examples include the personnel and nonpersonnel expenditures for the superintendent's office, business office, and personnel office. These expenditures could be allocated to individual schools on a reasonable basis (e.g., percentage of students or personnel in each school). However, the reported expenditures would be arbitrary and represent only an accounting allocation to distribute centralized expenditures to the school level; they would not necessarily be related to school activities or controlled by school personnel.

## Staff Data

The availability of staffing data and the ability to track staff information to the school level will vary by state and district. Data on individual staff are generally maintained in personnel records at the district level. For each person they could include:

- General type of position (professional, administrative, and classified)
- Specific assignment (regular teacher, special education teacher, counselor, librarian, vice principal, secretary, custodian, business administrator, etc.) and time assigned to position (full-time or full-time equivalent)
- Location of assignment (specific school, multiple schools, central office, transportation office, etc.)

The availability of staffing data and the ability to track staff information to the school level will vary by state and district.

- Professional qualifications (education background, academic degrees and institutions granting them, certifications held, date hired, and time in service)
- Current salary and benefits

These staff data can be aggregated in a variety of ways to produce personnel statistics for the district and, in some cases, for individual schools. For example, the number of staff, by type can be summed for each school and for the district so that the number of administrative, teaching, other professional, and classified staff in a school can be determined.

Some district information systems keep more specific data by individual. For example, if the district currently maintains and reports information by grade level or academic department, then it would be possible to identify staff resources by grade level or subjects taught (e.g., mathematics, English, science, etc.) within each school. Likewise, for staff in split assignments, if the district records the time allocated to each assignment or FTE, then more accurate data on staff resources committed to individual schools and programs can be obtained. However, staff information systems that track how various personnel allocate their time among different programs or services or students are not consistent across districts.

At present, educational expenditure data are available at the district level for all states.

### Student Data

Student data systems are designed to report numbers of students along a variety of dimensions. The focus is on numbers of students, rather than on how they spend their time in schools. Enrollment data will give counts of the numbers of students in the district and in each school and, perhaps, by grade level or subject matter. The measure will generally be established by state reporting requirements (e.g., average daily membership, and average daily attendance). Further breakdowns, by type of student (regular, special, vocational, etc.) in the district and in each school are generally possible. However, beyond the general designation of the type of instruction for the students, little more detailed information is usually collected about how student time is allocated or spent among various academic programs, specific courses, support services, etc., unless required by state reporting or funding requirements.

Performance measures for students are receiving greater attention as the demand increases for higher achievement and more accountability. Some states have testing programs where standardized tests are administered at various grade levels and the results are reported by school.[4] However, these are usually for a limited number of grades or students in a school or district. National testing results, such as college entrance examinations (SAT or ACT) or advanced placement tests, can also be reported by district and school, although these are for graduating high school students and not all students take these tests. Other performance data tend to be developed and reported by individual schools or districts. As a result, the most common performance measures are specific to individual schools or districts and therefore not generalizable or even uniformly available. The measures often focus primarily on particular factors in schools or districts that illustrate or emphasize positive results.

## Current Data Reporting Situation

### Expenditures

At present, educational expenditure data are available at the district level for all states. The general format is based on guidelines provided by Fowler (1997). While they may vary in the details, state school accounting systems generally follow the fund-function-object-program organi-

[4] See for example, the Pennsylvania State System of Assessment program that tests students in grades 5, 8, and 11 in the areas of reading, mathematics, and writing.

zation, in which expenditure data are categorized by the fund (collection of accounts), the function (purpose), the object of the expenditure (item), and the activity (program). An overview of the primary function-object-program categories is shown in table 3. A complete list of funds, functions, objects, and programs for school districts can be found in the federal financial accounting handbook.

For the function dimension, the primary categories represent the major areas of activity of a school district: instruction; support services; noninstructional services; facilities acquisition and construction services; and other uses. Each of these broad functions is further divided into subfunctions to provide greater specificity; in some cases, there may be four levels of detail within a single function.

The unfortunate exception to the detailed subfunction categorization is instruction. The federal handbook lists no subfunctions under instruction; rather it uses another dimension, program, to differentiate types of instructional or other related programs. The focus of the program dimension is on various instructional programs (e.g., regular programs, special programs, and vocational programs), although other noninstructional activities are also included. In practice, many states combine the function and program dimensions into a single dimension so that expenditures can be classified into different instructional programs.

Table 3.—Primary categories of current financial accounting system for school districts

| Function | Object | Program |
|---|---|---|
| Instruction | Salaries | Regular programs |
| Support services | Employee benefits | Special programs |
| □ Support services—students | Professional and technical services | Vocational programs |
| Attendance and social work | Property services | Other instructional programs |
| Speech pathology and audiology | Other purchased services | Nonpublic school programs |
| Guidance | Property | Community services |
| Health | Supplies | Enterprise programs |
| Psychological | Other objects | |
| □ Support services—instructional staff | Other uses of funds | |
| Improvement of instruction | | |
| Educational media | | |
| □ Support services—general administration | | |
| Board of Education | | |
| Executive administration | | |
| □ Support services—school administration | | |
| □ Support services—business | | |
| □ Operation and maintenance of plant | | |
| □ Student transportation | | |
| □ Support services—central | | |
| Operation of noninstructional services | | |
| □ Food service | | |
| □ Other enterprise | | |
| □ Community services | | |
| Facilities acquisition and construction | | |
| Other uses | | |
| □ Debt service | | |

SOURCE: Fowler, W.J. 1997. *Financial Accounting for Local and State School Systems, 1990.* Washington, DC: U.S. Department of Education, National Center for Education Statistics (NCES 97-096R).

Additionally, it is possible to use the same account code dimension to include the level of education to differentiate among elementary, middle, and high school expenditures in each of the instructional programs (e.g., instruction, regular, and high school). For the new federal financial accounting handbook, it is recommended that instructional subfunctions be added; they should correspond to the major subdivisions of instructional programs—regular programs, special programs, vocational programs, and other instructional programs.

Objects of expenditure are the items for which expenditures are made; they include salaries, benefits, purchased services, supplies, property, other objects, and other uses of funds. By coding the function, object, and program dimensions for a single expenditure, the accounting system provides a more detailed record. For example, the specific expenditures for salaries of special education instructional personnel (perhaps separated into professional and classified staff), benefits for staff in the principal's office, or supplies for the guidance program can be specified through the accounting code structure.

Accounting systems, by their nature and design, focus on expenditures and revenues of a school system.

Most school accounting systems also contain a dimension to record the operational unit of an expenditure. This feature provides the opportunity to identify expenditure data by school building or any other cost center that a district may designate. This makes it possible to provide detailed expenditure data by school when combined with the function/object/program reporting, at least for direct school expenditures.

However, operational unit is currently an optional classification in the federal handbook and in most state education accounting systems, and is not reported by most school systems. Consequently, most school accounting systems do not collect and record comprehensive expenditure data at the school level, particularly for joint or centralized expenditures that require an allocation procedure. For example, school accounting systems can report the expenditures for the combined computer hardware purchases in the district, but except for internal cost control purposes, may not regularly report these expenditures for an individual school. Further, it is not possible to aggregate such expenditures to the state level since school-level data are generally not available nor do standardized reporting protocols exist for districts to use.

### Staff and Student Data

Accounting systems, by their nature and design, focus on expenditures and revenues of a school system. Consequently, student and staff data are not available from accounting systems. These data are generally maintained in separate systems with reporting requirements and categories that do not always align with the reported expenditures. A further shortfall in student information is the lack of consistent and reliable performance data to measure student outcomes.

As a result, the independent accounting, personnel, and student information systems do not produce or report adequate data for any of the major stakeholder groups. School-level expenditure information is not readily or completely available. Likewise, neither school-level information on student activity and performance nor staffing information, which provides resource allocation data at the school level, are routinely collected by school districts in a uniform manner. Average district costs, which are currently reported, mask variations among schools and cannot be linked with student activity and student performance data or staff data from individual schools. Unfortunately, these are just the kind of data that are needed to analyze and assess school reform efforts.

## Accounting Approach

The essence of the accounting approach is that it is a downward accounting extension (DAE) of the current district-level approach to record and report expenditures at the level of individual schools. This approach would build on the existing accounting sys-

tem and expand it by adding new accounts at the school level for every school to record expenditures at the building level. This extension would be facilitated with the use the current optional dimension for operational unit to identify expenditures by school. In fact, many school systems already identify some expenditures by school in their internal accounting system, even if they are not required by the state or other agencies. In short, this is an approach familiar to school administrators and "Because of the strong congruence in the requirements of a district-level and a school-level financial accounting system, it should be possible for most states to . . . implement school-level [expenditure data] collections in all school districts and schools" (Sherman, Best, and Luskin 1996, xvii).

Currently, 19 states report that they already require school-level expenditure reporting.[5] For example, Pennsylvania school districts are required to report education costs, including expenditures by each school for classroom instruction, instructional student support, and facilities and plant management costs. Additionally, they also have to report expenditures for special education, non-instructional student support, professional development, and technology.[6] This trend is anticipated to grow and intensify with additional states requiring school-level expenditure data in the coming years.

There are many reasons for states to mandate school-level financial reporting. School costs are rising rapidly and more money is being requested at both the local and state levels to fund education. There is greater demand for accountability that is tied to the increased funding from legislators, governors, school boards, parents, and taxpayers. No longer is an aggregated district-level expenditure per student amount sufficient. Rather there is an interest in examining down to the school level, where the funds are actually spent, how much money is being spent on education and if the spending is equitable, adequate, efficient, and productive. School administrators also have need of actual expenditure data in their management and improvement of school operations. School-level expenditure data form the basis for budget development, which is the primary resource reallocation process in school districts. Actual expenditure data are necessary to fulfill the fiduciary responsibilities of administrators and school boards to ensure that the funds are both legally and effectively used. Detailed information is also useful for the financial community in evaluating the fiscal soundness of school districts for credit and bond ratings.

Data collected and reported by the DAE would be the actual expenditures associated with individual schools. Utilizing the current financial accounting system approach with the operational unit dimension, expenditures would be assigned an accounting code to indicate the fund, function, object, program, and school for the expenditure. If greater detail were desired, other currently optional expenditure dimensions are available that could identify the level of instruction (elementary, middle, secondary, or individual grade) and the subject matter (e.g., English language arts, mathematics, natural sciences, and social sciences). These data would be collected at the school and district office and entered into the district's computerized accounting system. From there, sorting the basic expenditure entries by one or more of the coded dimensions could generate any number of reports. Examples of these types of reports are illustrated in table 4. In the first example, all expenditures in the school are specified by instructional program or function. In the second example, the costs of special education programs in the school are further reported by object of expenditure. The third example presents school expenditures for supplies by subject matter.

Currently, 19 states report that they already require school-level expenditure reporting.

[5] Based on a survey by the authors that asked states to self-report school-level expenditure reporting requirements and collected their annual financial report documents.

[6] PA Senate Bill 652, Section 613. (2000).

Table 4.—Examples of school reports from downward accounting extension data

School: Alva High School, Code: 81

1. Expenditures by instructional program and function

| Code | Function/description | Amount |
|---|---|---|
| 1100 | Regular programs | $2,310,200 |
| 1200 | Special programs | 362,000 |
| 1300 | Vocational programs | 384,800 |
| 1400 | Other instructional programs | 36,900 |
| 2120 | Guidance services | 10,500 |
| 2130 | Health services | 23,450 |
| 2140 | Psychological services | 12,350 |
| 2210 | Improvement of instructional services | 5,600 |
| 2220 | Educational media services | 74,200 |
| 2410 | Principal's office | 147,600 |
| 2610 | Building services operations | 98,750 |
| Total | | $3,466,350 |

2. Expenditures for special education program, by object

| Code | Object/description | Amount |
|---|---|---|
| 100 | Salaries | $243,800 |
| 200 | Benefits | 85,300 |
| 300 | Purchased professional services | 7,500 |
| 400 | Purchased property services | 0 |
| 500 | Other purchased services | 4,400 |
| 600 | Supplies | 14,200 |
| 700 | Property | 5,600 |
| 800 | Other objects | 1,200 |
| Total | | $362,000 |

3. Expenditures of supplies, by selected subject matter areas

| Code | Subject/description | Amount |
|---|---|---|
| 02 | Art | $1,540 |
| 08 | Physical education | 510 |
| 11 | Mathematics | 6,300 |
| 12 | Music | 675 |
| 18 | General education | 26,205 |
| Total | | $35,230 |

SOURCE: Authors' sketch.

The accounting approach to obtaining school-level data would focus on expenditures and would not expand to include student or staff data. That integration would have to happen outside the accounting system.

## Resource Cost Model Approach

### Description

The RCM uses an economic basis for establishing costs of educational programs.

It is based on measurement of physical resources employed in an activity, as opposed to the determination of actual expenditures. It utilizes a formal methodology of transforming physical resources into appropriate costs. Four steps are common to its application (Issacs et al. 1999, II-1–5).

1. Specifying the structure of the service delivery systems and the types of physical ingredients (e.g., teachers, books, etc.) used in delivering services.
2. Measuring the intensity of these resources by quantifying them.
3. Assigning prices to the specific physical ingredients.
4. Using the price data to aggregate resources across the entire program to determine overall program costs.

As defined by Chambers (1999, 19), "A service delivery system is a collection or combination of resources (i.e., inputs) that is specifically organized to provide a certain service to a target population or students or clients." Examples given for instructional service delivery systems are a self-contained classroom for elementary grades 1–3, and a language-arts pull-out program for disadvantaged students. Other service delivery systems at the school level could include: instructional support activities, such as the school library, guidance counselor, or speech pathologist; administrative activities, such as the principal's office; and operational support activities, such as custodians.

The physical ingredients that comprise a service delivery system are those resources that are necessary to carry out its activities. For example, in an elementary classroom, those ingredients could include the teacher, a part-time aide, associated benefits, supplies, equipment, classroom space, and utilities. In a comprehensive RCM, all of the resources utilized by the service delivery system would be included. However, "because personnel represent the predominant resource in a social service enterprise like education and personnel can be readily measured in terms of some measurable physical quantities (Chambers 1999, 51)," the focus of the RCM is frequently on personnel resources to the exclusion of the other nonstaff resources.

An additional element of the service delivery system is its capacity. For instructional systems, this is typically specified in terms of number of students (class size or workload) that can be served by one unit. Individual service delivery units can be combined into larger service delivery systems. An example of this is in table 5, where the personnel resources of all classroom units, support units, and administrative units that function in a single location are collected into a single school system.

The intensity for personnel resources is measured in terms of quantity and can take many forms. In table 5, the unit of measurement is full-time and part-time positions. Other measures may be used in different school districts, such as FTE positions, number of days, or number of hours. For example, rather than assuming all part-time personnel are allocated half-time to their assignment as is done in the example, more precise FTE amounts could be utilized, such as 0.4 FTE for a nurse assigned to the school for two days per week (2 days/5 days = 0.4 FTE).

In order to measure the resources in monetary terms, it is necessary to translate the physical quantities into dollar amounts. In the RCM, this is done by assigning prices to each resource and then multiplying the quantity of each resource by its associated price. However, a potential difficulty arises at this point with the choice of a price to assign to personnel resources. The two alternatives are the actual price (salary and benefits) of the specific individuals who deliver the services or a standardized price for all similar positions. Each choice has its advantages and disadvantages, particularly when using the resultant cost data to compare different schools or programs.

In order to measure the resources in monetary terms, it is necessary to translate the physical quantities into dollar amounts.

Table 5.—Illustration of resource cost model: Staff resources at Rosemont School,[1] by physical ingredients, quantities, prices, and total costs

| Physical Ingredients | Quantity | | Price per unit[3] | Total cost |
|---|---|---|---|---|
| | Full-time | Part-time[2] | | |
| Classroom teachers | 15 | 0 | $48,000 | $720,000 |
| Music/art teacher | 0 | 2 | 48,000 | 48,000 |
| PE teacher | 1 | 1 | 48,000 | 72,000 |
| Special Education teacher | 1 | 0 | 48,000 | 48,000 |
| Principal | 1 | 0 | 75,000 | 75,000 |
| Vice Principal | 1 | 0 | 62,000 | 62,000 |
| Librarian | 0 | 1 | 47,000 | 23,500 |
| Counselor | 1 | 0 | 54,000 | 54,000 |
| Nurse | 0 | 1 | 39,000 | 19,500 |
| Social Worker | 0 | 1 | 50,000 | 25,000 |
| Psychologist | 0 | 1 | 60,000 | 30,000 |
| Speech Pathologist | 0 | 1 | 52,000 | 26,000 |
| Library aide | 0 | 1 | 24,000 | 12,000 |
| Health aide | 1 | 0 | 22,000 | 22,000 |
| Special Education aides | 2 | 0 | 21,000 | 42,000 |
| Bilingual/ESL aides | 3 | 2 | 21,000 | 84,000 |
| Other teacher aides | 3 | 2 | 21,000 | 84,000 |
| Secretaries | 1 | 1 | 28,000 | 42,000 |
| Food service workers | 0 | 2 | 19,000 | 19,000 |
| Custodians | 2 | 0 | 26,000 | 52,000 |
| Total | 32 | 16 | | $1,560,00 |

[1] Rosemont is a hypothetical elementary school of 400 students.

[2] Each part-time person is assumed to work half-time in the school.

[3] Prices are based on national staff salary averages, increased by a 28 percent fringe benefit rate.

SOURCE: Issacs, J.B., Garet, M.S., Sherman, J.D., Cullen, A., and Phelps, R. 1999. *Collection of Resource and Expenditure Data on the Schools and Staffing Survey.* Washington, DC: U.S. Department of Education, National Center for Education Statistics. (Working Paper 1999–07).

The last step is to total the costs of the service delivery system by summing the costs of the individual resources in the system. The result is the cost (actual or standard, depending on the types of prices used) of the service delivery system. The critical aspect of the RCM is that the costs are built up from the service delivery system(s) that make up the school and include the particular resources involved, their quantities and prices. This makes it possible to compare schools and programs along the dimensions that make a difference in both costs and student outcomes. "To understand the factors that affect variations in the costs of services requires an accurate description of how resources are combined, allocated, and utilized to provide those services" (Chambers 1999, 22).

## Data Needs

Implementation of the RCM will require collection of data that identify resource use at the school level and in direct support of the school-level activities. The basic unit of analysis is that of the service delivery system, so resources must be reported by that unit. In the comprehensive implementation of the RCM approach, all of the resources contributing to the delivery of a particular service, both personnel and nonpersonnel, are combined. All services

are then consolidated to establish the full resource consumption of the unit and then the individual units are further combined into school-level costs. However, in practice, data collection may be limited to personnel time only since these resources constitute the bulk of educational costs. Nonpersonnel resource data, if included, can be collected for the physical quantities utilized (e.g., types of supplies, textbooks, and computers), but it is also possible to substitute the expenditure amounts (actual or average) for nonpersonnel resources as a shortcut measure to resource consumption.

The RCM approach to obtaining school-level data would concentrate on a detailed specification of staff time. Student data would need to be collected by the same categories as resources. These include both student enrollment data by program and service along with student outcome measures. However, the student system would be a separate data system and not necessarily part of the RCM approach.

## Areas of Common Concern

Both the accounting approach and the RCM approach face common issues that need to be resolved regardless of which system would be utilized. These areas affect each approach in similar ways.

### Definition of a School

The first issue is the definition of what constitutes a school. This prerequisite, regardless of which approach is used, necessitates a "clear definition of what constitutes a 'school' to which financial activities should be assigned" (Sherman, Best, and Luskin 1996, 18). A definition for a public school is available from NCES:

> An institution which provides educational services and has the following characteristics (Young 1999):
>
> - Has one or more grade groups (prekindergarten through grade 12) or is ungraded;
> - Has one or more teachers to give instruction;
> - Is located in one or more buildings or sites;
> - Has an assigned administrator;
> - Receives public funds as primary support;
> - Is operated by an education agency.

However, for consistency and uniformity in data collection and reporting it is necessary to go beyond this general definition and establish decision rules that cover all situations, such as multiple buildings on a single site, multiple programs in a single building, and special centers.

### Expenditures to Include

This leads to another difficult issue—what expenditures or costs to include at the school level. The range of expenditures includes: direct expenditures made at the school site (e.g., salaries, benefits, and supplies); joint expenditures made for several schools; expenditures made at the district level identifiable with individual schools; and all district expenditures, even those that have to be arbitrarily allocated to the school level. In particular, the question arises as to whether it is appropriate or useful to allocate district office expenditures that are unrelated to specific school activities, such as superintendent's office, business office, and debt service, to the school level. On one hand, when such expenditures are not allocated, the result will be an incomplete picture; on the other hand, an arbitrary allocation is simply an accounting calculation for expenditures over which a school cannot exercise control and should not be held accountable. An intermediate position is to allocate only those expenditures logically and reasonably identifiable to a specific school. In this approach, district-wide expenditures at the central or district level would not be allocated to schools. The

Both the accounting approach and the RCM approach face common issues that need to be resolved regardless of which system would be utilized.

RCM approach faces the same choices, except that the allocation is based on personnel time and standardized costs instead of actual expenditures.

### Allocation Procedures

In order to allocate some or all nondirect expenditures to individual schools, allocation procedures would need to be clear, uniform, and utilize readily available data. There are relatively few bases for allocation that meet these criteria; they include number of students, number of staff, staff time, square footage of the building, and, perhaps physical quantities of selected nonpersonnel resources, such as computers. Once again, the RCM approach will require procedures for any allocations of nonschool resources to individual schools.

Regardless of which approach is used to collect school-level financial and resource data, any analyses will require student data to allow calculation of per pupil expenditure amounts.

### Level of Data Collection and Reporting

Another critical issue to resolve is the level to which data collection and reporting systems should go and amount of detail to include in school-level records. Clearly, a school-level data system needs to report information at the individual school level. The question though is whether lower levels of reporting are reasonable and practical. This decision represents a trade-off between the benefits of increased levels of detail and the costs of collecting such data.

The level of detail should be established based on the type of program analyses that are desired. The primary options are illustrated in table 6; they include the major functions, various programs and further subdivisions within instruction, and subfunctions for the support and noninstructional areas. Under the RCM approach, similar categories for data collection and reporting of resources would also be needed.

The existing federal and state financial accounting systems already have provisions for several of these levels of reporting (Fowler 1997, 24–26, 33–34). The program dimension is a currently required reporting level that permits coding of expenditures by the type of program. These are specified as: regular programs; special programs, including mentally retarded, physically handicapped, emotionally disturbed, learning disabled, culturally deprived, bilingual, and gifted and talented; vocational programs; school-sponsored cocurricular activities; and school-sponsored athletics. Other classifications in the present scheme are optional and not utilized by all states and districts. The operational unit dimension can be used "to designate a budgetary or cost center;" or "to segregate costs by building structure" (Fowler 1997, 33). The level of instruction dimension permits classification of expenditures by grade level or grade grouping (e.g., elementary, middle, secondary). The subject matter dimension allows organization of expenditures by subject area (e.g., English language arts, mathematics, natural sciences, and social sciences). The support services expenditures at the school level for students, instructional staff, and operations can be gathered through the current subfunctions that categorize these activities.

### Student Data

Regardless of which approach is used to collect school-level financial and resource data, any analyses will require student data to allow calculation of per pupil expenditure amounts. The primary requirement is that the student data be collected in compatible categories with the financial data. Information on the numbers of students at the school is needed, as well as the numbers by the subcategories used in the financial data system. That is, if expenditures by instructional program are collected, then the number of students served by each of the instructional program categories also needs to be collected. For example, the number of students in special education needs to be collected and reported in order to determine the costs per pupil of that program.

The same is true of data reporting student results. In order to conduct analyses for either the accounting approach or the RCM

Table 6.—Dimensions of school-level expenditure reporting

| |
|---|
| **Major function** |
| Instruction |
| Support services |
| Noninstructional services (e.g., Food service) |
| **Type of instructional program** |
| Regular education |
| Special education |
| Compensatory education |
| Vocational education |
| **Grade level** |
| Individual grade |
| Elementary |
| Middle/junior high school |
| High school |
| Secondary |
| **Subject matter or discipline** |
| Multiple options representing courses or groups of courses |
| **Classroom** |
| Individual teacher |
| **Support services—students** |
| Attendance and social work |
| Guidance |
| Pupil health |
| Psychological services |
| Speech pathology and audiology |
| **Support services—instructional staff** |
| Improvement of instruction |
| Educational media |
| **Operational support** |
| Operation and maintenance of buildings, grounds, and equipment |
| **Administration** |
| School level |

SOURCE: Authors' sketch.

approach, student outcome measures need to be collected in a compatible format with the expenditure or resource utilization data.

## Areas of Difference Between the Two Approaches

The accounting approach and the RCM approach also have differences in the way that they treat or deal with important issues in collecting and reporting school-level data. These are discussed below and summarized in table 7.

### Focus of Approach

*Accounting approach*

The accounting approach is concerned with actual expenditures. These are precise amounts based on the district's financial accounting records. All amounts are measured in dollars. The use of familiar and "true" expenditure amounts lends credibility to the results for school and district level personnel as well as state and national policymakers.

*RCM approach*

The emphasis of the RCM approach is on resource consumption, rather than actual expenditures. Consequently, the measures focus on physical quantities of resources. It is possible to include all personnel and nonpersonnel resources in the data collection, although limiting the data to personnel resources captures the most important and the majority of the resources used in the educational process. The tradeoffs involve the loss of potentially important resource information, such as technology resources used in an instructional program, compared with the additional effort and cost to collect all resource elements.

In order to monetize the resource quantities in the RCM approach, standard prices for each resource are applied to calculate a standard cost for the resources consumed. The RCM example shown previously in table 5 illustrates this procedure. In the example, there are 15 classroom teachers in the school. That quantity is multiplied by a standard salary amount of $48,000 to calculate a standard salary cost of classroom teachers (15 x $48,000 = $720,000). By contrast, the accounting approach would sum the actual salary amounts for each teacher (likely ranging from $30,000 to $60,000) to determine the actual salary expenditures for classroom teachers (for example, $795,000 if the actual salaries are higher than the average). As a result, the costs reported for teachers under the RCM procedure will be different from the actual expenditure. As this example illustrates, the resulting cost information may not make sense nor seem useful or familiar to school and district personnel since standardized salaries, rather than actual salaries, are used in reporting. Further, the cost data reported by the RCM will not correspond to the expenditures for the same school reported by the accounting system, which could cause credibility problems for the RCM among school personnel and possibly lead to rejection of the "theoretical" costs.

### Unit of Analysis

Since the school-level data are the primary concern, the school is the major unit of analysis for both the accounting and the RCM approach.

Since the school-level data are the primary concern, the school is the major unit of analysis for both the accounting and the RCM approach. However, the two approaches get to the school level from different directions.

*Accounting approach*

The accounting approach starts at the school level with its data collection procedures and accounts. If additional detail is desired, there can be a further breakdown to collect and report information by function, program, grade, or subject matter within the school.

*RCM approach*

By contrast, the RCM approach is much more of a bottom-up effort where the primary unit of analysis is the service delivery system (which corresponds to the program level in the accounting system). The individual service delivery systems that op-

Table 7.—Differences of approaches for school-level data

| Issues | Accounting approach | Resource cost model approach |
|---|---|---|
| Focus of approach | Actual expenditures | Consumption of resources |
| Understandable, believable expenditure data | Use of actual expenditure data corresponds to actual amounts and enhances face validity of reported data | Use of standard salary and benefit data to develop expenditures causes difference between actual expenditures and reported results; can cause confusion and rejection of results |
| Unit of analysis | School, with lower levels of detail possible through subfunctions and programs | Service delivery system with aggregation of units up to school level |
| Type of data required | Actual expenditures, by accounting categories: function; object; and program | Physical resources utilized; can include all personnel and nonpersonnel items, but may be limited to personnel only |
| Information collected and reported | Dollars spent, by accounting categories: function; object; and program | Use of personnel and other resources, by service delivery system; resource combinations utilized |
| Approach to data collection | Existing accounting system procedures extended to school level | Additional personnel reporting to obtain staff time allocations among service delivery systems |
| Timing of data collection | Ongoing as expenditures occur | Periodic on specified dates or ongoing with individual time reporting |
| Difficulty of implementation | Use of existing district-level accounting system should make implementation easier | New personnel data system can make implementation more difficult |
| Startup costs for data collection | Significant startup effort to create new school- level accounts and procedures | Significant startup effort to create new school-level procedures for personnel time and nonpersonnel resource consumption |
| Ongoing burden to maintain data system | Less effort to operate school-level expenditure data collection; done primarily by clerical staff | Burdensome for staff if individual time reporting is required |
| Comparative analyses | Variations in total or per pupil expenditures, by level, school, function, program, and time | Variations in resource use in instructional (and other) programs and can link different resource mixes with student outcomes |
| Usefulness for analysis | Can determine variation in expenditures, but not causes for differences among programs or student outcomes | More useful for understanding how programs operate; with use of standard prices can determine separate effects of price, quantity, capacity, and mix of resources used to achieve results |
| Limitations for analysis | Unable to separate effects of price, quantity, capacity, and mix of resources used to achieve results | Without monetizing personnel resource use, cannot easily combine multiple staff services or compare alternative program approaches<br>Focus on personnel data primarily and not including nonpersonnel resources |

SOURCE: Authors' sketch.

erate within the school are combined to make up the school unit.

## Type of Data

*Accounting approach*

The accounting approach requires actual expenditure data for the school categorized by function, object, and program. Additional levels of detail are available by including additional dimensions in the accounting code structure to classify expenditures, such as grade level in elementary schools and subject matter in secondary schools.

*RCM approach*

To match its focus, the RCM approach collects data on the physical resources utilized in the school's service delivery systems and others if they are allocated to the school. For personnel resources, the primary basis is the time allocated to a given system, measured in counts of staff, full-time equivalent staff, or contact time detailed in days, hours, or minutes. In order to establish standard costs for the resources, it is also necessary to determine appropriate salary levels for key positions, such as state or national average salary amounts for classroom teachers, instructional aides, speech therapists, and principals. For the salaries to be comparable across geographical areas, they are then indexed to compensate for differences in the cost of living. Consequently, it will be possible to report on the combinations of resources utilized in various service delivery systems in either personnel time or standard costs that are comparable across schools within a particular state or in another state in the nation.

The need to collect detailed information on the allocation of staff time to service delivery systems will require new procedures.

Nonpersonnel resources, if they are included, can be collected in physical quantities (e.g., number of computers, desks) and have standard prices applied to them to calculate standard costs. Alternatively, the actual expenditure amounts can be used as a proxy for resource consumption to avoid extensive data collection for a minor portion of the budget.

## Approach to Data Collection

*Accounting approach*

The current financial accounting system can be extended downward to collect and report data at the school level. If states were to modify their school accounting systems to mandate the use of the operational unit dimension (which is now optional), a school identifier code would be created in their accounting systems. To implement this DAE, districts would have to create and maintain school-level expenditure accounts similar to those at the district level. The implementation of a school-level accounting system would substantially increase the number of accounts utilized by a school district since many accounts that now exist only at the district level would have to be duplicated for each school. While this may be a significant undertaking, it is one with which school personnel are familiar. In fact, many districts already account for expenditures at this level of detail.

*RCM approach*

The need to collect detailed information on the allocation of staff time to service delivery systems will require new procedures. The time of each staff member will have to be assigned to one or more programs so that 100 percent of the time of all personnel is accounted for. The most straightforward procedure would to use either district personnel records that maintain actual staff assignments by FTE positions by school and service delivery system (program) or budgeted staff positions. In the case of split assignments, allocations could be made using consistent decision rules to divide staff time among their work assignments. More precise data collection would involve establishing new, more costly, and time-consuming procedures for personnel to report their actual time spent by service delivery system on an ongoing or periodic basis.

## Implementation Issues

*Accounting approach*

Extension of an existing accounting system from the district to the school level would make implementation easier since the personnel are familiar with the primary dimensions and procedures of the system.

However, notwithstanding the familiarity with the accounting system, there will be additional effort and costs involved to implement a school-level accounting system that will replicate many of the district-level accounts for each school in the districts. In order to provide necessary function-object-program accounts at the school level an estimated 300 new individual accounts would be required for each school.[7] For larger districts with many schools, this could be a sizable task.

*RCM approach*

Establishment of a new personnel data system will be an additional burden on both district and school personnel. Such a task could be a major undertaking both in developing the collection system and gaining acceptance for its use among schools. This would be particularly true if the new data collection system requires added effort on the part of school instructional and support personnel to report their time.

## Effort to Maintain Data System

*Accounting approach*

The additional effort to operate the school-level accounting system would consist of data entry and maintenance of the chart of accounts with the new school-level expenditure accounts. The marginal costs of entering an additional code for the operational unit are minor since every expenditure is currently coded with function-object-program information. For those districts that already use the operational unit dimension, there is no additional data entry work. However, a larger chart of accounts to which expenditures must be posted will involve more effort on the part of the district business office.

*RCM approach*

If individual time reporting is required of all personnel, then a substantial ongoing effort will be necessary both to report the data and to collect and organize them into an appropriate system. However, if less burdensome procedures can be utilized (e.g., personnel assignment records, and budget records), then the level of effort could be substantially reduced.

## Types of Analyses and Usefulness

*Accounting approach*

The accounting approach will provide data on expenditures at the school level by function, object, and program, and by grade or subject matter if the system is extended down to that level. This will permit comparative analyses of per student expenditures by school level and by any of the subcategories utilized by the accounting system. For example, regular education expenditures per student can be compared across all the elementary schools in a district, or with state or national averages. In a particular district or a region, the variations in expenditures per student can be a useful initial analysis to identify outliers (low or high spenders) as schools for further investigation.

Although the accounting approach can provide useful information on the magnitude of the variation in per student spending levels, it does not provide any means of identifying the causes for such disparities. Differences in reported expenditures per student for special education between two schools are the result of several factors, including different salary levels for the staff positions, different combinations of personnel resources, and different capacities of the program. So what might appear to be an efficient (lower cost) school might really be only the result of younger staff (and associated lower salary levels) or a program that has

...there will be additional effort and costs involved to implement a school-level accounting system that will replicate many of the district-level accounts for each school in the districts.

[7] Based on an estimated 10 function/program accounts combined with an estimated 30 object accounts within each school.

larger class sizes. In fact, lower salary levels might mask underlying inefficiencies in the manner in which the program is delivered. On the other hand, the lower cost program might have achieved its results by using a more efficient combination of personnel and nonpersonnel resources. In either event, the expenditure per student information from the accounting system will not allow determination of the causes of spending differences.

*RCM approach*

The strength of the RCM approach is the data that it provides for analyzing educational programs. With data on resource use in instructional and other service delivery systems it is possible to examine the differences among similar programs in terms of how programs are delivered. Analyses can establish the mixes of personnel and nonpersonnel resources that are used and potentially link the allocation of resources to student outcomes.

The strength of the RCM approach is the data that it provides for analyzing educational programs.

Use of a standardized salary rate for each staff position has advantages for the interpretation of cost differences among schools. For example, since all similar positions will have the same salary assigned to them, any actual salary differences due to different levels of experience or education will be factored out. Any variations in the costs of schools or programs between or among districts would be due to differences in the organization and operation of the service delivery system (i.e., choices of resources used in the system, quantities of resources used, and capacity of the system).

If standard prices are not used and the analysis is based on variations in personnel use (time spent), then comparisons among service delivery systems that employ multiple staff in alternative combinations are very difficult. However, the use of standard prices permits such comparisons, as illustrated in table 8. Elementary School A uses 24 teachers to achieve an average class size of 18.8, but uses no instructional aides. School C makes a different choice employing 18 teachers along with 9 instructional aides to serve its students with an average class size of 25 students. Which school uses more resources? A RCM analysis can compare the two instructional approaches in terms of their choice of personnel. Using the standard prices for personnel in table 5, the analysis indicates that School A consumes approximately $100,000 more resources (in standard cost terms) than School C.

Which school is more efficient? This is a more difficult question to answer. Instructional programs in School C cost $100,000 less to operate, but this is caused by replacing six teachers with nine aides. The result is a higher student/teacher ratio in School C (25.0 to 18.8), but a lower student/adult ratio (16.7 to 18.8) than in School A. If the student outcomes were similar, then School C would be more efficient—same results for less cost. However, if School A achieved higher student outcomes (i.e., is more effective), then the issue becomes are the student gains worth the increased cost? While the RCM analysis does not answer this policy question, it

Table 8.—Comparison of resource consumption

| | | School A | | School C | |
|---|---|---|---|---|---|
| Position | Standard cost | Number | Cost | Number | Cost |
| Students | | 450 | | 450 | |
| Teachers | $48,000 | 24 | $1,152,000 | 18 | $864,000 |
| Aides | $21,000 | 0 | 0 | 9 | 189,000 |
| Total | | | $1,152,000 | | $1,053,000 |
| Student/teacher ratio | | 18.8 | | 25.0 | |
| Student/adult ratio | | 18.8 | | 16.7 | |

SOURCE: Authors' sketch.

poses it as an important issue to be resolved. In general, the use of standard costs with resource use data permits the analyst to cost out the variations in the use of resources and to compare the costs of each school and the costs of achieving the student results.

If the choice is to focus only on personnel resources, then the analysis is not complete since nonpersonnel resources are not included. This may not be a serious limitation in many service delivery systems where personnel are the dominant resource, but it could prove misleading for programs that employ a high degree of nonpersonnel resources, such as trading a greater use of technology for fewer personnel.

## Synthesis of Two Approaches

To reach a synthesis of the accounting and RCM approaches to the collection and reporting of school-level financial data, the following recommendations incorporate the positive aspects of each approach while avoiding the primary problems of the different perspectives. Taken together, the selected components form a single combined approach that balances the differing data needs of the various stakeholders with the costs and burden of obtaining such data. The synthesis of the two approaches is actually the choice and definition of the elements from the accounting and RCM approaches that provide the framework to measure education expenditures at the school level for the purpose of linking student costs to student results.

The recommendations for a synthesis of the two approaches are presented by major element and are summarized in table 9. The first element, *choice of approach*, proposes the accounting approach to collect expenditure data and the Resource cost model approach to collect staff data. The next three elements, *elements to include at the school level*, *elements to remain at the district level*, and *level of reporting*, provide recommendations on the reporting structure for direct, multiple and centralized expenditures and staff data. In addition, these elements propose the reporting of expenditure and staff (service delivery systems) data in a structure that can be useful from the school level to the national level. The synthesis of the two approaches also defines the reporting systems for the collection of *staff* and *student* data elements in a comparable format. Finally, the *analysis* component in the school-level data system defines how the data elements can be used to determine variations in student expenditures and staffing patterns as well as for productivity study.

### Choice of Approach

The DAE of the financial accounting system is recommended as the approach to obtaining expenditure data at the school level. The current district-level accounting system would be extended to the school level. The operational unit for reporting expenditure data would become a mandatory dimension in state school accounting systems. If this recommendation is made in the new federal fiscal accounting handbook, states would be encouraged to modify their school accounting systems to report school-level fiscal data. In turn, a requirement by states for districts to report school-level data would necessitate creating school-level accounts for all expenditures at that level. An earlier pilot test of collecting school-level expenditure data in the standardized NCES function and object categories found that districts had difficulty in reporting financial data at the school level; only half of the pilot districts completed the expenditure survey (Issacs et al. 1999). However, the pilot districts were in states that did not require school-level accounting and the procedures were unfamiliar and proved very time-consuming. By contrast, if the reporting of school-level expenditure were mandatory, states and school districts would develop standardized operating procedures. The new procedures would become part of the accounting system and would become just as routine as the district-level expenditure data collection and reporting system is now.

The DAE of the financial accounting system is recommended as the approach to obtaining expenditure data at the school level.

Table 9.—Synthesis of two approaches for school-level data system

| Elements | Accounting approach | Resource cost model (RCM) approach |
|---|---|---|
| Choice of approach | Accounting approach for expenditures | RCM approach for staff resources; nonpersonnel resources excluded |
| Elements to include at school level | All direct school-level expenditures | All direct school-level personnel |
| | Allocation of joint and multiple expenditures to school level | Allocation of personnel serving multiple schools |
| Elements to remain at district level | Centralized expenditures not identifiable by school; maintained by subfunction and object | No allocation of time of central office personnel |
| Level of reporting | All school-related expenditures, by function/object/program | Service delivery system, corresponding to program structure in accounting approach |
| | Key data elements reported to higher levels via a data pyramid | |
| Staff | | Separate system gathering budgeted time allocated by staff to school activities; organized by service delivery system (program/function) |
| Students | Expenditure function/program categories compatible with student data categories | Separate system to collect number of students (full-time equivalent), by service delivery system (program) |
| | Outcome measures, by student and program | Outcome measures, by student and program |
| Analyses | Variation in expenditures per student by school, function, and program | Variation in staffing patterns, by service delivery system and school |
| | | Application by analysts of standard prices to staff categories to estimate standard costs and causes of variation |
| | | Productivity analyses combining staff, standard costs, and student outcomes |

SOURCE: Authors' sketch.

The RCM approach is recommended for collecting school-level staff data. Information on the deployment of staff resources is critical to school districts since personnel are their most important and most costly resource. The recommended data collection process would use district personnel records that report actual staff assignments by FTE positions by school and within the school by instructional program or support function. These basic records would be extended, if necessary, by allocating the time of any staff assigned to more than a single area in the school.

## Elements to Include

All direct school-level expenditures should be the first component to include. These are all objects of expenditure (staff salaries, benefits, purchased services, supplies, property, and other objects) that are directly identified with an individual school. In recording these expenditures into the accounting records, the operational unit code for the school would be included.

Secondly, all joint and multiple expenditures that are made for instruction, instructional support, or operational support activities for two or more schools should be allocated to those schools in a reasonable and consistent way. Examples of these services are: attendance and social work, guidance, health, psychological, speech pathology and audiology, improvement of instruction, educational media, school administration, and operation of maintenance and plant. They are consistent with the support services subfunctions in federal and state school accounting manuals.

To make the allocated expenditure data comparable across schools and districts, a uniform set of allocation procedures would need to be established. The rules for allocation should be related to the cause of the expenditure, easy to understand, and utilize readily available data. As previously noted, only a few allocation methodologies meet these criteria; they include number of students, number of staff, staff time, square footage a building, and physical quantities of important nonpersonnel resources, such as computers. Choice of a basis for allocation of a particular expenditure should be logical and related to the type of expenditure. For example: the personnel costs for a speech therapist serving students in multiple schools could be allocated on the basis of the number of students served in each school; the personnel costs for a school nurse who spends two days per week in one school and three days per week in another could be allocated 40 percent (2 days/5 days) to the first school and 60 percent (3 days/5 days) to the other; and the costs of a cleaning contract with a maintenance firm could be allocated to the schools on the basis of square footage of each building.

Staff resource utilization data should follow the same pattern as expenditures. The time for all personnel who work full time in a school should be reported at that school. Any personnel serving multiple schools should have their time allocated between the schools on the same basis.

Consistency is a critical consideration for reporting school-level data. While there may be legitimate differences of opinion about which specific expenditures or staff to include at the school level or to remain at the district level or about the most appropriate allocation methodology for a given joint or multiple expenditure, it is important that those decisions be made the same way by all schools and districts in a state and, to the extent possible, by all states. Only by establishing consistent procedures through state school accounting policies can the resulting data be reliable and useful for comparative analyses.

Only by establishing consistent procedures through state school accounting policies can the resulting data be reliable and useful for comparative analyses.

## Elements to Remain at District Level

It is further recommended that district level expenditures, which are not directly identifiable with one or more schools, be accounted for at the district level and not allocated to the schools. These include services such as governing board, executive services, business services, centralized operation and maintenance services, transportation, centralized support (planning, information, staff, and data processing), community services, and debt payments. Again, these categories are consistent with existing federal and state educational accounting systems.

School administrators and other school-level personnel have little authority over or responsibility for centralized district-level expenditures. So, rather than load schools with nonschool-level expenditures, the school-level data should reflect only school-level operations.

With this division, centralized expenditures can be maintained and reported at the level of those responsible for the expenditures. This also permits a more useful district-level analysis of these expenditures, in which expenditures per student for centralized services can be compared across districts, variations identified, and areas for management attention noted. In a similar fashion and for the same reasons, staff time for personnel in centralized office activities should not be allocated to the school level.

## Level of Reporting

Expenditures should be reported at the school level by function, object, and program. This follows the current practice at the district level. This level of reporting allows individual school expenditure data to be collected on instructional and support activities, by personnel and nonpersonnel items, by type of instructional program, and by all combinations of these dimensions. An example of the type of expenditure data that could be reported is shown in table 10. Four main groupings are given: instruction, instructional support, operational support, and administration. Where appropriate, subcategories are used to provide additional detail. These functions capture the main aspects of educational activities at the school level and would be reported for all direct expenditures and those allocated to the school from joint, multiple, or central office expenditures specifically identifiable with the school. At the object of expenditure level, salaries and benefits would be shown separately, but all nonpersonnel items would be reported in a single grouping. However, if additional detail were desired for a comparative or analytical purpose, the data would be available.

Table 10.—Expenditures reported at school level

| |
|---|
| Instructional programs |
| Regular programs |
| Salaries* |
| Employee benefits* |
| Nonpersonnel expenditures* |
| Special programs |
| Vocational programs |
| Other Instructional programs |
| Instructional support functions |
| Attendance and social work |
| Guidance |
| Health |
| Psychological |
| Speech pathology and audiology |
| Improvement of instruction |
| Educational media |
| Operational support |
| Administration |

* These three types of objects will be reported for all programs and functions.

SOURCE: Authors' sketch.

## Data Pyramid

With detailed expenditure data collected at the school level, a data pyramid can be created in which key elements would be reported from one level to the next—school level to district level, district level to state level, and state level to national level. It would function as a reduced form reporting system in which only selected data would be reported going up the pyramid from one level to the next and those data would be selected for policy and decision making relevance. The diagram for the data pyramid is given in table 11.

At each level, there would be a summary that reports the averages for that level and selected data for the levels below. To function effectively, there would have to be a limited number of data elements reported from one level to the next and the reporting system would need to include not only expenditure data, but also staffing and student data in the compatible categories. This approach is illustrated in table 12. For example, for expenditures at the state level, there would be:

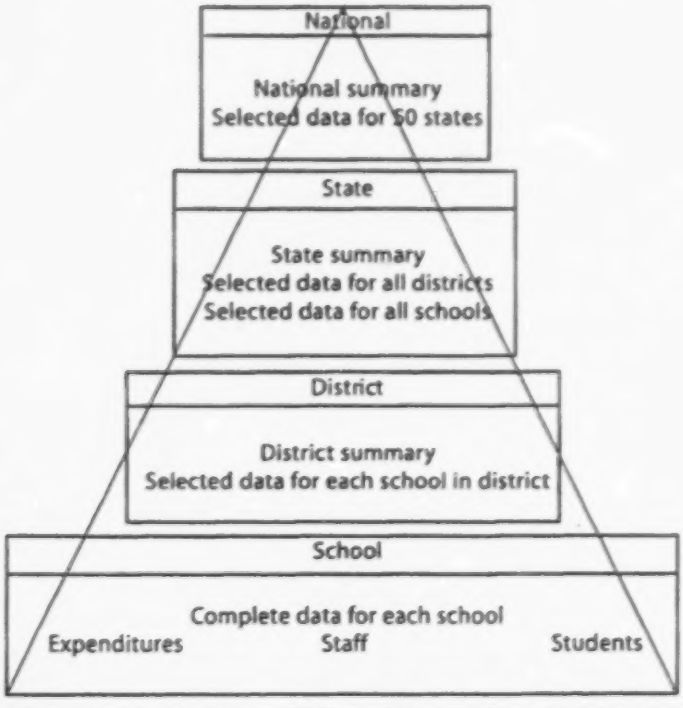
1. a summary of expenditure data categories for the state (total and by each type of school);

2. selected data for each district that would include both central office and school-level expenditures; and

3. selected expenditure data for each school.

However, the school-level data reported at the state level would only be the key indicators relevant for educational policymakers and not all of the expenditure and resource use data collected at each school.

Table 11.—Illustration of data pyramid




SOURCE: Authors' sketch.

Table 12.—Elements in data pyramid at each level

**National**

Summarized for nation: total and averages, by type of school (elementary, middle, high)

Selected data for each state

| Expenditures (cost per student)[1] | Staff (full-time equivalent (FTE), student/FTE)[2] | Students (enrollments) |
|---|---|---|
| Total | Total | Total |
| By instructional program | By instructional program | By instructional program |
| Regular programs | Regular programs | Regular programs |
| Special programs | Special programs | Special programs |
| Instructional support | Instructional support | |
| Operational support | Operational support | Student outcomes |
| Administration | Administration | Regular programs |

**State**

Data summarized for state: total and averages, by type of school (elementary, middle, high)

Selected data for each district

Selected school-level data for each school

| Expenditures (cost per student)[1] | Staff (FTE, student/FTE)[2] | Students (enrollments) |
|---|---|---|
| Total | Total | Total |
| By instructional program | By instructional program | By instructional program |
| Regular programs | Regular programs | Regular programs |
| Special programs | Special programs | Special programs |
| Instructional support | Instructional support | |
| Operational support | Operational support | Student outcomes |
| Administration | Administration | Regular programs |

**District**

Data summarized for district: total and averages, by type of school (elementary, middle, high)

Selected school-level data for each school

District-level expenditures (not allocated to schools)

| Expenditures (cost and cost per student)[1] | Staff (FTE, student/FTE)[2] | Students (enrollments) |
|---|---|---|
| Total | Total | Total |
| By instructional program | By instructional program | By instructional program |
| Regular programs | Regular programs | Regular programs |
| Special programs | Special programs | Special programs |
| Compensatory programs | Compensatory programs | Compensatory programs |
| Vocational programs | Vocational programs | Vocational programs |
| Other programs | Other programs | Other programs |
| Instructional support | Instructional support | |
| Operational support | Operational support | Student outcomes |
| Administration | Administration | Regular programs |

Table 12.—Elements in data pyramid at each level–Continued

| School | | |
|---|---|---|
| Data for each school in district | | |
| Expenditures (cost and cost per student)[1] | Staff (FTE, student/FTE)[2] | Students (enrollments) |
| Total | Total | Total |
| By instructional program | By instructional program | By instructional program |
| Regular programs | Regular programs | Regular programs |
| Special programs | Special programs | Special programs |
| Compensatory programs | Compensatory programs | Compensatory programs |
| Vocational programs | Vocational programs | Vocational programs |
| Other programs | Other programs | Other programs |
| By instructional support function | By instructional support function | |
| Library | Library | Student outcomes |
| Media | Media | By instructional program |
| Technology | Technology | Regular programs |
| Guidance | Guidance | Special programs |
| Psychological services | Psychological services | Compensatory programs |
| Speech pathology and audiology | Speech pathology and audiology | Vocational programs |
| Social work | Social work | Other programs |
| Pupil health | Pupil health | |
| Operational support | Operational support | |
| Administration | Administration | |

[1] Expenditure data reported by personnel, benefits, and nonpersonnel.

[2] FTE for professional and nonprofessional staff.

SOURCE: Authors' sketch.

The optional dimensions of the current accounting system of level of instruction and subject matter will remain available for those states and districts that wish to collect and report expenditures at lower levels. Coding expenditures by these dimensions would allow a district to compare the costs of third grade classrooms within a school or across all schools in the district or make a similar comparison of the costs of 11th grade mathematics. However, there is a substantial cost to creating such information, both in the development of the procedures and structure to collect and report the data as well as the effort for individuals to maintain the system. At this time it does not appear that the benefits outweigh the cost of a further downward extension of the accounting system and it is recommended that these dimensions not become mandatory for all districts.

Since the RCM focuses on the service delivery system as the unit of analysis, the level of staff resource utilization should be reported at this level. However, for compatibility with the expenditure data, it is necessary that the service delivery system definitions correspond to the program structure (for instruction) and function structure (for support activities) of the accounting system. Otherwise, data from the two systems would not be organized in the same categories and their use for analysis would be compromised.

## Staff

Staff data would be collected through the RCM approach. The data should be organized by service delivery system, but as previously indicated these categories should be compatible with the program categories utilized for expenditures in the accounting system. Within each service delivery system, staff data should be collected and reported

by the major types of staff in a school system. The staff positions should be compatible with the standardized listing of the staff categories available from the NCES Staff Data Handbook (Malitz 1995); it specifies ten major categories with more detailed breakdowns of subcategories within each one. The major categories and their descriptions are shown in table 13.

The staff data elements are the time for all school personnel, reported as FTEs. Time of personnel serving several schools would be allocated appropriately among the schools involved.

Table 13.—Staff categories

| | |
|---|---|
| Official–administrative | Performs management activities that require developing broad policies and executing those policies through direction of individuals at all levels. This includes high-level administrative activities performed directly for policy makers. |
| Professional–educational | Performs duties requiring a high degree of knowledge and skills generally acquired through at least a baccalaureate degree (or its equivalent obtained through special study and/or experience) including skills in the field of education, educational psychology, educational social work, or an education therapy field. |
| Professional–other | Performs assignments requiring a high degree of knowledge and skills usually acquired through at least a baccalaureate degree (or its equivalent obtained through special study and/or experience) but not necessarily requiring skills in the field of education. |
| Paraprofessionals | Works alongside and assists professional individuals. |
| Technical | Performs tasks requiring a combination of basic scientific knowledge and manual skills which can be obtained through approximately two years of postsecondary education such as that which is offered in community/junior colleges and technical institutes, or through equivalent special study and/or on-the-job training. |
| Office/clerical/administrative support | Performs the activities of preparing, transferring, transcribing, systematizing, or preserving communications, records, and transactions. |
| Crafts and trades | Performs tasks requiring high manual skill level which is acquired through on-the-job training and experience or through apprenticeship or other formal training programs. This assignment requires considerable judgment and a thorough and comprehensive knowledge of the processes involved in the work. |
| Operative | Performs tasks requiring intermediate level manual skills which can be mastered in a few weeks through limited training to operate machines. This includes bus drivers and vehicle operators. |
| Laborer | Performs tasks requiring some manual skills which can be conducted with no special training. This includes individuals performing lifting, digging, mixing, loading, and pulling operations. |
| Service work | Performs tasks regardless of level of difficulty which relates to both protective and nonprotective supportive services. |

SOURCE: Malitz, G. 1995. *Staff Data Handbook: Elementary, Secondary, and Early Childhood Education.* NCES Handbook. Washington, DC: U.S. Department of Education, National Center for Educational Statistics (NCES 95–327).

## Students

Student data collection would not be a component of either the accounting or RCM approach. Rather, it should be done in a separate system compatible with the accounting program structure and the RCM service delivery categories. Students should be measured in numbers of students, preferably FTE students in each program.

Student outcomes measures or performance indicators are necessary for effectiveness and accountability analyses. Such measures and indicators also are not a part of either the accounting or RCM approach, but they should be collected by student in the same format as the accounting program structure and the RCM service delivery categories.

## Analyses

With the accounting approach to the collection of expenditure data combined with student participation data, it will be possible to calculate the expenditure per student along several dimensions, including total school, instructional programs within a school, and functions within a school. This will permit analyses of the variation in expenditures per student along these dimensions. It will also permit comparisons of the expenditures among schools in a single district or among schools across the state or nation. With these analyses, high and low expenditure schools can be identified and targeted for further investigation on the reasons for their deviation.

To illustrate an analysis utilizing data from the accounting approach, a single district example is shown in table 14 that compares expenditures across three elementary schools of the same size. The expenditure data would be available from the accounting approach. The expenditure data are combined with the student data to calculate expenditure per student. The three

Table 14.—Expenditure comparisons among elementary schools in a single district using data from the accounting approach

| Students | | Aster | Bluebell | Camellia | District |
|---|---|---|---|---|---|
| Regular programs | | 450 | 450 | 450 | 1,350 |
| Special programs | | 45 | 40 | 50 | 135 |
| **Function** | **Description** | | | | |
| 1100 | Regular programs | 1,779,900 | 1,483,000 | 1,164,600 | 4,427,500 |
| | Cost per student | 3,955 | 3,296 | 2,588 | 3,280 |
| 1200 | Special programs | 290,650 | 227,700 | 238,450 | 756,800 |
| | Cost per student | 6,459 | 5,693 | 4,769 | 5,606 |
| 1400 | Other instructional programs | 315,300 | 344,300 | 349,900 | 1,009,500 |
| | Cost per student | 701 | 765 | 778 | 748 |
| 2100 | Student support services | 33,800 | 29,900 | 24,050 | 87,750 |
| | Cost per student | 68 | 61 | 48 | 59 |
| 2200 | Instructional staff support | 135,200 | 149,500 | 96,200 | 380,900 |
| | Cost per student | 273 | 305 | 192 | 256 |
| 2410 | Principal's office | 258,900 | 233,700 | 207,150 | 699,750 |
| | Cost per student | 523 | 477 | 414 | 471 |
| 610 | Building operation | 281,500 | 254,600 | 277,750 | 813,850 |
| | Cost per student | 569 | 520 | 556 | 548 |
| | School total | $3,095,250 | $2,722,700 | $2,358,100 | $8,176,050 |
| | Cost per student | $6,253 | $5,557 | $4,716 | $5,506 |

SOURCE: Authors' sketch.

schools have widely differing costs per student, ranging from a high of $6,253 in Aster Elementary to a low of $4,716 in Camellia Elementary. Each of the main instructional programs and support subfunctions also show varying costs per student among the schools. While the expenditure comparisons will not explain why the costs are different among the schools, they do indicate that there are substantial differences and suggest further investigation to arrive at the causes of the differences.

With the addition of staffing data that would be available from the RCM approach, some of the reasons for the differences among the schools can be investigated. Staffing data in FTE positions assigned to the schools are shown in table 15 along the same categories as the expenditures. Although the schools are the same size, they have chosen to utilize different quantities and types of staff, particularly in regular program. The staff data can then be used in a more detailed analysis.

To continue the illustrative analysis, regular programs, the main instructional program and largest single expenditure area, is selected. The reasons for the differences in per student expenditures in regular programs are explored in table 16. For regular programs, Aster has the highest per student cost, $3,955 while Camellia remains the lowest at $2,588. The data required for this analysis come from the three primary groups—expenditures, staff utilization, and students. The school-level expenditures would be available from the accounting approach, the number of teachers in each school by program would be available from RCM staff assignment information, and the numbers of students in each school could be obtained from existing student reporting systems. Table 16 shows the expenditure data for regular programs in greater detail, in which salaries for teachers and aides, benefits, and nonpersonnel expenditures are reported separately. The reason for the suggested focus on personnel expenditures (salaries and benefits) is demonstrated by the high percentage of total program expenditures that they represent—from 88 to 91 percent across all schools.

Examining the staff data for regular programs (table 15), Aster uses only teachers in its regular program, while the other two schools have varying combinations of teachers and instructional aides. Using the numbers of teachers and aides, the average salary for each group is calculated. This analysis uncovers a primary cause of the per student differences. Aster has an average salary per teacher of $52,000, while the salaries of teachers at Camellia average $37,000, a $15,000 difference per teacher. The most likely explanation for these differences would be the greater seniority or education level of teachers at

Table 15.—Staffing comparisons among elementary schools in a single district using data from the resource cost model approach

| Function | Description | Aster | Bluebell | Camellia | District |
|---|---|---|---|---|---|
| 1100 | Regular programs–teachers | 24.0 | 21.0 | 18.0 | 63.0 |
| | Regular programs–aides | 0.0 | 4.0 | 9.0 | 13.0 |
| 1200 | Special programs | 4.0 | 3.5 | 4.5 | 12.0 |
| 1400 | Other instructional programs | 3.0 | 3.5 | 4.0 | 10.5 |
| 2100 | Student support services | 0.5 | 0.5 | 0.5 | 1.5 |
| 2200 | Instructional staff support | 2.0 | 2.5 | 2.0 | 6.5 |
| 2410 | Principal's office | 1.5 | 1.5 | 1.5 | 4.5 |
| 2610 | Building operation | 2.5 | 2.0 | 2.5 | 7.0 |
| School totals | | 37.5 | 38.5 | 42.0 | 118.0 |

SOURCE: Authors' sketch.

Table 16.—Analysis of expenditure differences in regular programs using data from the accounting and resource cost model approaches

| Description | Aster | Bluebell | Camellia | District |
|---|---|---|---|---|
| Expenditure detail | | | | |
| Teacher salaries | 1,248,000 | 966,000 | 666,000 | 2,880,000 |
| Aide salaries | 0 | 64,000 | 126,000 | 190,000 |
| Total salaries | 1,248,000 | 1,030,000 | 792,000 | 3,070,000 |
| Benefits | 374,400 | 309,000 | 237,600 | 921,000 |
| Nonpersonnel costs | 157,500 | 144,000 | 135,000 | 436,500 |
| Personnel costs (percentage) | 91 | 90 | 88 | 90 |
| Total regular programs | $1,779,900 | $1,483,000 | $1,164,600 | $4,427,500 |
| Cost per student | $3,955 | $3,296 | $2,588 | $3,280 |
| Causes for expenditure differences | | | | |
| Differences in average salaries | | | | |
| Average salary per teacher | $52,000 | $46,000 | $37,000 | $45,714 |
| Average salary per aide | — | $16,000 | $14,000 | $14,615 |
| Cost per student at district average salaries | $3,520 | $3,262 | $3,057 | $3,280 |
| Staffing ratios | | | | |
| Student/teacher ratio | 18.8 | 21.4 | 25.0 | 21.4 |
| Teacher/aide ratio | — | 5.3 | 2.0 | 4.8 |
| Student/adult ratio | 18.8 | 18.0 | 16.7 | 17.8 |
| Mix of personnel | | | | |
| Teachers | 24.0 | 21.0 | 18.0 | 63.0 |
| Aides (weighted by salary ratio)* | 0.0 | 1.4 | 3.4 | 4.2 |
| Total weighted staff | 24.0 | 22.4 | 21.4 | 67.2 |

— Not applicable.

* Salary ratio is the ratio of average aide salary to average teacher salary. This ratio shows the equivalent teachers that aide salaries could purchase.

SOURCE: Authors' sketch.

Aster and the relatively low seniority or education level of teachers at Camellia.[8] Lower variations are present in the average aide salaries.

The use of standard prices for personnel resources (an RCM analytical procedure) permits the calculation of standard costs of service delivery systems and the impact of different salary levels as a cause of variations among schools. This is also illustrated in table 16 where the cost per student at each school is recalculated using the district average teacher salary for all schools. This removes the average salary differentials as a cause of variation. This lessens the per student differences, but does not eliminate them; the variation per student has been reduced from $1,367 with actual salary levels to $463 using average salary levels.

However, salaries are not the only cause of per student expenditure differences. Another cause is the different staffing ratios among the schools. The student/teacher and student/aide ratios, calculated from staff and student data at each school, also produce per student expenditure differences among the schools. The low student/teacher

[8] In most districts, teacher salaries are primarily determined by length of service and educational level with length of service having the largest impact.

ratio at Aster (18.8) translates into higher per student costs, while the higher ratio at Camellia (25.0) results in lower per student costs. So for Aster both the higher average teacher salary and the lower student/teacher ratio create higher per student costs; at Camellia the reverse is true. The lower teacher costs for Camellia (and Bluebell) are partially offset by the addition of the expenditures for instructional aides.

The mix of personnel is the third cause of cost variations. More detailed staff utilization data from the RCM, such as differentiation of staff within programs, permits analysts to examine variations in staffing patterns in schools and instructional programs. Applying the salary ratio (average aide salary to average teacher ratio) to the number of aides gives the number of equivalent teachers that the monies allocated to aide salaries could buy for each school. Aster has the highest number of weighted staff, which raises the cost per student, and Camellia has the lowest number of weighted staff, which results in a lower relative cost per student. In other words, the nine aides employed in Camellia cost much less than the six teachers that they replaced (in comparison with Aster). Further calculations could quantify the amount of expenditure variation attributable to each factor.

Along with student data, the accounting and RCM approaches provide many more opportunities for perceptive and beneficial uses of the data than either approach alone.

Additional analyses linking the standard cost information with student outcomes can lead to more detailed analyses and the identification of high performing and cost-effective programs. In turn, these results can lead to policy decisions and legislation that directs funding toward these programs. Through dissemination of the research results and policy directives, school and district administrators can focus their efforts on more effective instructional approaches.

## Summary: Stakeholders and Recommended Approaches

To summarize, the synthesis of the accounting and RCM approaches to the collection and reporting of school-level data is predicated on a downward extension of the current district-level accounting system and the collection of personnel data (allocation of time) utilizing the RCM approach. The combination of the two approaches provides both financial and personnel resource information at the school level. Having school-level expenditure data for both management control over operations and comparisons among schools enhances understanding of the allocation of funds. Availability of personnel time allocations for the same programs and functions permits improved analyses of program operation and effectiveness. Along with student data, the accounting and RCM approaches provide many more opportunities for perceptive and beneficial uses of the data than either approach alone.

How well do the recommendations fill the information needs of stakeholders for school-level data and how will the data procedures deal with the major issues facing them? Table 17 presents a summary response to these questions, which is supported by the following discussion.

### Schools and School Districts

The DAE fits the needs of school and district administrators and school boards. It provides school-level financial data that are compatible in content and format with the existing district-level accounting system. Consequently, while the implementation of the DAE requires additional effort, it does not represent a new or unfamiliar approach to the collection and reporting of financial data. In fact, many districts already use the operational unit dimension of the accounting system that is recommended to be made mandatory. The expenditures to include for the school-level data are the direct expenditures for the school along with the allocation of joint and multiple expenditures identifiable by school. District office expenditures are not allocated to the school, but are accounted for separately at the central level. The resultant financial data are focused on expenditures at or related to the school; these are expenditures that are

Table 17.—Stakeholders and synthesis of school-level data

| Stakeholders | Accounting approach | Resource cost model (RCM) approach |
|---|---|---|
| School administrators<br>District administrators<br>School boards | Easily understood extension of present district-level accounting system | |
| | Can collect expenditure data without substantial change to present operation | Staff data obtained from district staff assignment reports or budget, not from personnel time reporting system |
| | Can use information by program to monitor and compare school expenditure performance | Can compare staff use by program and compare different mixes of instructional staff |
| | Can use expenditure comparisons to identify areas for improvement and take action | Can use staff use comparisons to identify areas for improvement and take action |
| | Centralized expenditures kept at level with authority for them | Have access to research reports to identify most effective and cost-efficient practices |
| | Have data to maintain fiduciary responsibilities | |
| Researchers<br>Policy analysts | Have expenditure data for comparative analyses | Will have staff resource use data for comparative analyses of staffing patterns |
| | | Can apply standard costs to staff data to develop comparative analyses of program and school operation |
| | | Can use staff data, standard costs, and student outcome measures to develop analyses and comparisons of cost-effective programs |
| State policymakers<br>National policymakers | Uniform system of collecting and reporting school expenditure data | Uniform system of collecting and reporting staff utilization data |
| | Extension of present accounting system to school level is a straightforward step | Collection of staff time data can be done from budget plans and not require an extensive time reporting system |
| | Have statewide and national comparative data for monitoring use of public funds and policy decisions | Analyses of cost-effective programs provide information for resource allocation decisions and educational policy |

SOURCE: Authors' sketch.

reasonably under the authority and responsibility of the school principal.

The school-level expenditure reporting by instructional program and support functions provide school and district administrators with information to develop accurate school-level budgets, to monitor school-level spending, to maintain fiduciary responsibility for public funds, and to compare levels of spending across schools within a district, within a region, or with similar schools in the state or nation. The comparisons should

lead to identification of spending levels within a given school that are higher and lower than comparative schools. Armed with this information, administrators and school staff can target appropriate areas for improvement and take action to rectify problem areas. When combined with student outcome measures, the school-level expenditure data will facilitate accountability analyses at the school level. The separation of district-level expenditures will permit more relevant comparative analyses of district-level operations.

Staffing data will also be produced at the school level that will specify the number of staff (FTE) in the same instructional program and support function categories as expenditures. This consistency will permit combination of the data for comparative analyses by school district personnel as well as researchers and policy analysts. Comparisons of staffing patterns can be made across schools and districts to identify efficient and inefficient practices.

School-level staff resource utilization data will provide researchers with significant and substantial new information to conduct a variety of important analyses.

### Researchers and Policy Analysts

The expenditure and staff allocation data available at the school level will allow researchers and policy analysts to fulfill their role as producers of analyses and reports for use by the other two groups. The expenditure data will permit comparative analyses of variations in actual spending across schools, programs, functions, and objects. These expenditure comparisons will lead to further investigations of equity and adequacy of the school spending.

School-level staff resource utilization data will provide researchers with significant and substantial new information to conduct a variety of important analyses. Examination and comparison of staffing patterns will yield insights into the effectiveness of different instructional approaches and, in turn, lead to recommendations of more effective resource allocation patterns and policies.

Application of standard prices to the school-level staff data permits analysts (not school or district personnel) to calculate and compare standard costs for various programs and school operations. Without the confounding factor of varying local prices for the same resource, it will be possible to determine the efficiency of different mixtures of personnel resources in instructional programs. Combining staff use and standard costs of programs with student outcome measures can lead to productivity analyses that identity cost-effective programs for replication by other districts and for funding by legislatures.

### State and National Policymakers

The recommended policies and procedures for school-level financial data establish a uniform system for collecting and reporting expenditure and personnel allocation information. While the implementation of a new and expanded system of data collection at the school level is not without costs, the synthesized approach represents an efficient means without placing undue burden on schools or school districts. The DAE uses a familiar system and data procedures that are extended to the school level. This approach is reported as being required in 19 states and many schools and districts in other states already utilize school-level expenditure data as well. Since district data systems need to keep track of their most valuable and expensive resource, people, collecting and reporting of school-level staff data will build on existing data procedures for maintaining control over personnel resources and not represent an overburdening task.

The synthesized approach will provide a considerably improved data system to document and compare spending levels for educational programs. Analyses and identification of effective programs and instructional approaches would become possible with detailed staff information. When combined with student outcome measures, significantly enhanced analyses will become possible to identify high performing programs and the underlying causes for their results. This will give state and national policymakers valuable information to monitor the use of public funds for education and to make future decisions about the magnitude and focus of new funding.

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